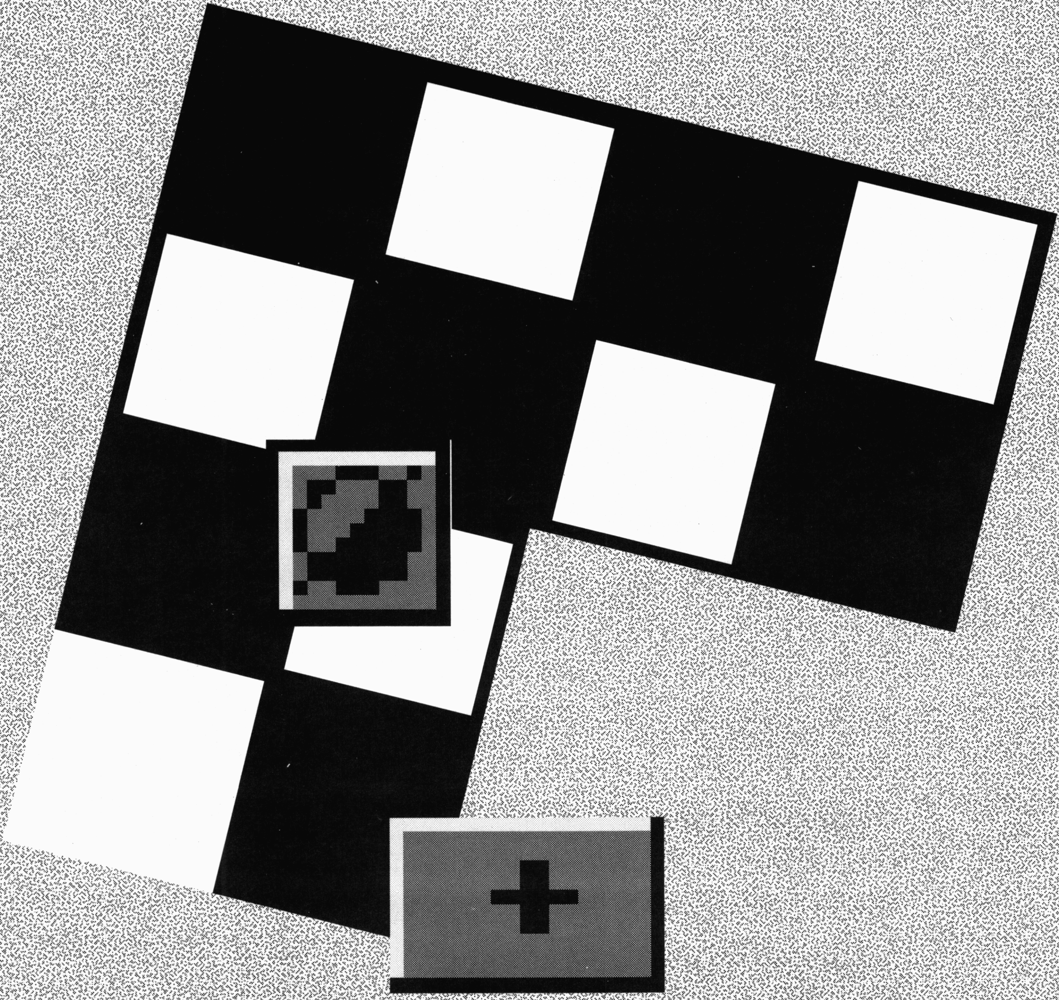
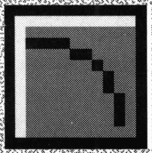
DELUXEPAINT® IV

PAINT AND ANIMATE IN 4096 COLORS.

Manual



DeluxePaint IV



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Note: Each chapter in the manual is preceded by a detailed table of contents.

Introduction

DeluxePaint IV is an upgraded and enhanced version of Electronic Arts' premier color paint program for the Amiga, DeluxePaint III. Its improved and more versatile range of paint and animation features were designed to meet the basic needs of amateur artists, while satisfying the rigorous requirements of graphics and video professionals.

If you're new to computer graphics, you'll want to read the next section, *For New Artists Only,* before you move on to the rest of the introduction to DeluxePaint IV. If you're an experienced computer graphic artist, you might want to move directly to *About the Manual,* below.

For New Artists Only

You are about to discover that DeluxePaint IV can help you create prototypes of your designs more quickly and easily than any traditional medium. You'll move from inspiration to execution in minutes instead of hours. We think that DeluxePaint IV's power and versatility can help you develop a new approach to graphic art. You'll soon find that DeluxePaint IV is ideal for creating graphic design comps, video and traditional animation, video titling, desktop presentations, and other desktop publishing applications.

DeluxePaint IV lets you do things that would be difficult, if not impossible, using traditional methods. For example, you can easily rotate a picture or flip it to create its mirror image. Shrink or expand an image as you wish, pick it up, and place it precisely. Or you can create a mathematically exact tonal range for your colors just by specifying the beginning and ending shades and the number of steps in between.

You can also move images from one part of the picture to another, or copy an image and paste it anywhere in your picture. Create a forest of leaves just by drawing a single leaf and pasting it throughout your picture. And make global changes to the colors in your artwork with a few keystrokes. DeluxePaint will help you find more efficient ways to create traditional effects.

You can save all your work on disk, so you don't have to create everything from scratch each time you work on a design. This means you can collect a library of images (called clip art) to use in future designs. Because you can save versions of your picture as you go, you can always return to an earlier state of a design and pick it up from there, if you like. Finally, because you can print as many originals of a picture as you need, or make unlimited copies of your data disks with no degradation from one generation to the next, there need never be just one original of a picture to lose or spill coffee on.

So, welcome to the world of computer-generated art. As you begin this great artistic adventure, we think you'll be impressed and delighted by DeluxePaint IV.

About This Manual

When you need help or simply want more information about DeluxePaint IV, this manual is the best resource. But you don't have to memorize the manual to master the program. We've organized the information here so you can quickly learn how to use the program in a manner that best suits your style and experience.

The manual assumes that you know your way around your Amiga. If you just recently acquired your computer, familiarize yourself with Amiga terminology and techniques *before* using DeluxePaint IV. ***You do not have to become an Amiga expert.*** But, *selecting, dragging, pointing,* and *clicking* should not be a mystery to you; nor should *menus, submenus, windows,* and *requesters* sound strange.

If any of these terms are unfamiliar, take a few minutes to browse through your Amiga User's guide, and make sure you read *Hints and Reminders while using DeluxePaint,* below, for some special tips. Knowledge of basic Amiga operations and features will help you learn to use DeluxePaint IV quickly and adeptly.

Every User Should Read

Before starting to work with DeluxePaint IV, there are three things that every user ought to do.

- ☐ Read *What's New in DeluxePaint IV* later in this introduction. It's especially designed for artists who are familiar with previous versions of DeluxePaint. DeluxePaint IV's exciting new features are briefly described there, and beginners will also find much useful information.
- ☐ Briefly review the Table of Contents to locate areas of special interest. Note that Chapters 4–7 assume familiarity with the more basic parts of the program.
- ☐ Carefully read ***Getting Started*** to be sure you have the all the proper equipment and software. If you have a hard drive, follow the numbered steps for installing DeluxePaint IV on it.

After you've read *What's New*, reviewed the Table of Contents, and installed DeluxePaint IV, use the manual in whatever way suits you and your work. Follow our ***Guided Tour*** or strike off on your own. You can always consult ***Reference*** if you need help or want more information. Here are a few approaches you can take to learn DeluxePaint IV, depending on your knowledge of computer graphics programs.

Beginning Computer Graphics Users

Work through ***Getting Started*** and the ***Guided Tour***—in order and in detail. These chapters describe the fundamentals of the program and introduce some advanced techniques. You'll start creating with DeluxePaint IV right away and learn about its more complex functions as you go along. After you've worked through the ***Guided Tour***, move on to what interests you. We highly recommend Chapter 4, ***Painting Tutorials.*** Keep the manual close by so you can consult ***Reference*** to learn more about other program features when you're ready.

Experienced Computer Graphics Users

If you're already familiar with DeluxePaint III, quickly scan ***What's New***, for new information. You'll find an introduction to some of the unique paint features of DeluxePaint IV there. Move on whenever you're ready. Use Chapters 4–8 and the Appendixes to learn more about powerful program features like color mixing, the LightTable, stencils, and animation.

Those Who Don't Read Manuals

If you don't read manuals as a rule, we still hope that you'll read ***Getting Started***. Keep this manual nearby, so you can consult it when you need to.

Hints and Reminders Using DeluxePaint IV

Conventions of the Manual

Several special elements in the manual's text are designed to make learning DeluxePaint IV easier.

▶ Right-pointing triangles indicate action items or steps. They mark how-to sections that present something you should do to understand a program feature or function.

□ Outline squares indicate a list of features, functions, or contents. *They do not indicate action items.*

❖ A note preceded by this symbol indicates important additional information, a warning, or a condition. Be sure to read every item that's labeled this way.

boldface	DeluxePaint IV's menu options and keystrokes appear in the text in simple boldface type. Every menu option is thoroughly described in Chapter 8, ***Reference***.
`special`	This special monospace typeface indicates characters that you should type.
Enter	Refers to the Enter key (sometimes called the Return key) on your keyboard. Enter is indicated on some keyboards by the ↵ symbol.
Backspace	Refers to the Backspace key, indicated by the ← symbol on some keyboards.
Control	Refers to the Control key (Ctrl) on your keyboard.
A	Refers to the Amiga key(s) on the bottom row of your keyboard. Some computers show these as Commodore key(s) **C=**.
Keyboard Equivalents ⇧	You can access many of DeluxePaint tools and functions directly from your keyboard. For example, typing the capital letter S activates the **Show Page** option, just as if you had chosen the option from the Picture menu. These keyboard commands *ARE* case sensitive, so when we show a command that requires a capital letter, like Q for **Quit**, make sure you hold down the Shift key as you type the letter. As you become more familiar with the program, you'll find that these keyboard shortcuts can save you time.

Using the Mouse

In this manual, we'll use the term *click* a few different ways to describe some standard mouse actions:

- ☐ CLICK means press and quickly release the *left* mouse button.
- ☐ DOUBLE-CLICK means press and quickly release the *left* mouse button *twice*.
- ☐ RIGHT-CLICK means press and release the right mouse button.

Dragging the Mouse

When you are asked to DRAG the mouse to perform some operation, we mean, hold down the LEFT mouse button and move the mouse, unless otherwise indicated.

Painting with the Mouse

The two mouse buttons let you switch between foreground and background colors while painting.

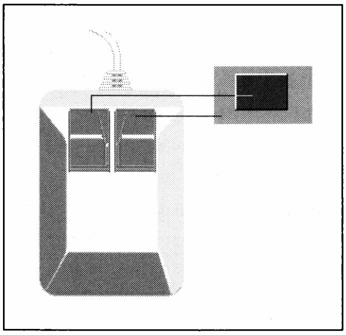
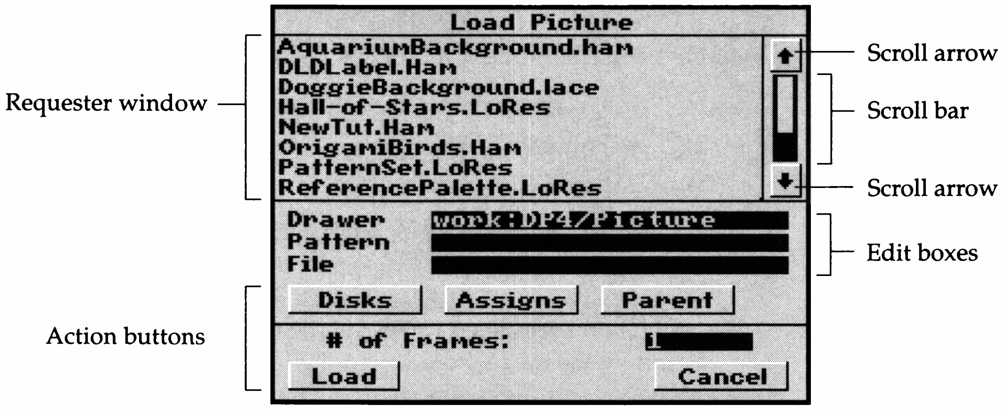


Figure I-1
Painting with the Mouse

Pressing the left mouse button paints with the current foreground color; pressing the right mouse button paints with the current background color. You can paint with either color using any of the painting tools. Likewise, clicking a color in the palette selects it as your foreground color, while right-clicking a color selects it as your background color.

Requesters

Requesters display items that you can choose. They always require some input from you. Some requesters let you modify the way a tool operates; other requesters let you load or save files.



AquariumBackground.ham
DLDLabel.Ham
DoggieBackground.lace
Hall-of-Stars.LoRes
NewTut.Ham
OrigamiBirds.Ham
PatternSet.LoRes
ReferencePalette.LoRes

Drawer work:DP4/Picture
Pattern
File

# of Frames: 1

Figure I-2 Load requester with too many files to show in one window

Action Buttons

Action buttons activate operations or commands made in the requester, or respond to a prompt. Clicking an action button usually closes the requester. If the requester has an OK button, clicking that button accepts any changes made to settings since the requester was opened. Cancel closes the requester without accepting any changes.

The highlighted item in the requester is the one currently selected. Any action buttons you click will affect the item currently selected.

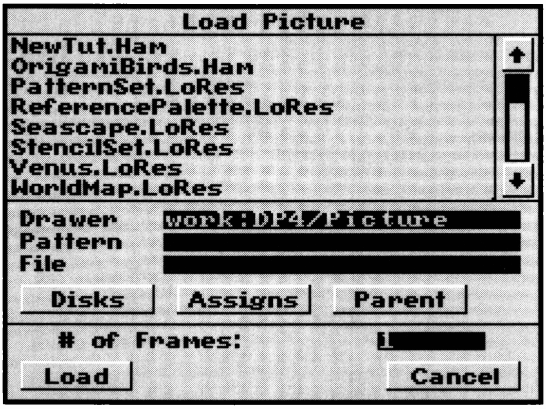
Scroll Bars

Scroll bars are used to move (scroll) through a list of items that's too large to appear in one window of a requester. For example, there are too many filenames to fit in one window of Figure 2. You have to *scroll* the window to see the names of files that are not visible. There are three ways to scroll through a list.

☐ Click the arrows on either end of the scroll bar.

☐ Drag the scroll box to either end of the scroll bar.

☐ Click the shaded area on either side of the scroll box.



Load Picture

NewTut.Ham
OrigamiBirds.Ham
PatternSet.LoRes
ReferencePalette.LoRes
Seascape.LoRes
StencilSet.LoRes
Venus.LoRes
WorldMap.LoRes

Drawer work:DP4/Picture
Pattern
File

# of Frames: 1

Figure I-3 Load requester with the remaining files exposed

Edit Boxes

Edit boxes let you enter file names or other information from the keyboard. Click in the edit box to place the cursor, then type any printable characters. Press the backspace key (←) to delete characters left of the cursor. Press Del to delete characters under the cursor.

Review these brief descriptions if you see something on screen that's unfamiliar. When you're ready to paint, move on to Chapter 1, ***Getting Started.***

What's New in DeluxePaint IV?

If you are familiar with DeluxePaint III, you'll quickly master the new features and enhanced functionality of DeluxePaint IV. You probably won't need to spend a lot of time working through this manual, but there are some special options here that you won't want to miss. This section briefly describes the major additions and improvements to the software and directs you to the areas where you'll find more information. For the straightforward changes, the best place to find information quickly is in Chapter 8, ***Reference***.

These are the big changes in the software.

HAM

The big news is DeluxePaint IV's support of HAM (Hold and Modify) screen format in either Lo-Res or Interlace mode. HAM gives you simultaneous access to all 4096 colors available on the Amiga. HAM's effects are most noticeable when you're color editing, and color mixing or spreading a range of colors, or defining gradients.

HAM has been implemented in virtually all areas of the program, and some features (like **Translucency** and **Process**) have been added to take advantage of the colors available in HAM. You can even animate in and easily manipulate HAM brushes and AnimBrushes.

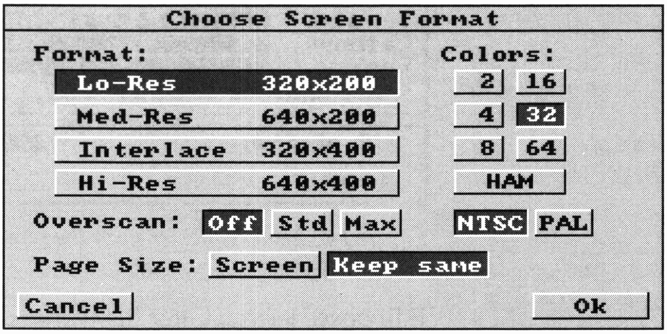

Choose Screen Format
Format:
Lo-Res 320x200
Med-Res 640x200
Interlace 320x400
Hi-Res 640x400
Colors:
2
16
4
32
8
64
HAM
Overscan:
Off
Std
Max
NTSC
PAL
Page Size:
Screen
Keep same
Cancel
Ok

Figure I-4 Choose Screen Format Requester

Animation

☐ Animation Control Panel. This on-screen panel's features provide more fluid and interactive control of your animations.

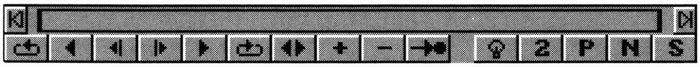


Figure I-5 Animation Control Panel

☐ The **Anim** menu has new options for adding, copying, and deleting animation frames. And you can now save and load "moves" which you have described for your animations from the Move requester.

☐ **LightTable** in the Effect menu. Key-frame animations are now possible. This allows the animator to display additional frames under the current frame. Using the "key-frame" as a template, the animator can easily paint in-between frames for an animation.

☐ **Metamorphosis** in the Brush menu. Transforms two custom brushes into an AnimBrush over a designated number of frames.

Palette

☐ We've added a Color Mixer to the palette. You can use the Mixer to interactively mix colors together to create new colors. Use the PICK option to copy the new color to your palette.

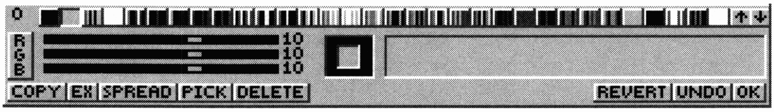

0
R
G
B
10
10
10
COPY
EX
SPREAD
PICK
DELETE
REVERT
UNDO
OK

Figure I-6 Color Mixer

- More efficient control of colors and color palettes from the Color menu. You can **Arrange** the palette to suit a given project. You can also **Load** and **Save** palettes and color sets as independent files. A palette doesn't have to be saved with a document to be accessible.

Special Features and Functions

We've added a number of general enhancements to the program.

- **Ranges** in the Color menu now allow you to choose colors from your entire color set, and use them to create virtually unlimited color cycling and gradient ranges. See Chapter 4, ***Painting Tutorials,*** for a tour of the new Range requester.
- **Beautiful gradient fills.** You have precise control of five different kinds of customized gradients from the Fill Type requester. Again, see Chapter 4, ***Painting Tutorials***, for an introduction to the new gradient fills.

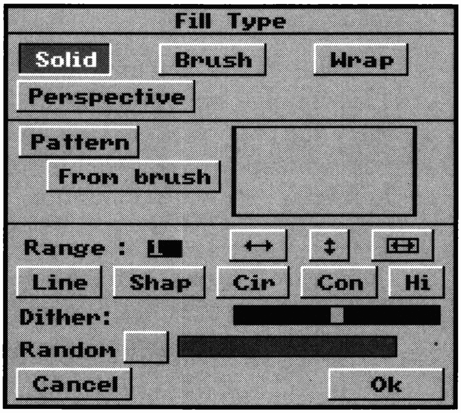

Fill Type
Solid
Brush
Wrap
Perspective
Pattern
From brush
Range :
Line
Shap
Cir
Con
Hi
Dither:
Random
Cancel
Ok

Figure I-7 Fill Type requester

- **Antialias**. When you antialias an image, you eliminate the "stair-step" effect that is apparent in bit-mapped images whose lines are not precisely vertical or horizontal. In the Effect menu you can choose from three antialias levels.
- The **Process** and **Translucency** options from the Effect menu let you tint an image "on the fly."

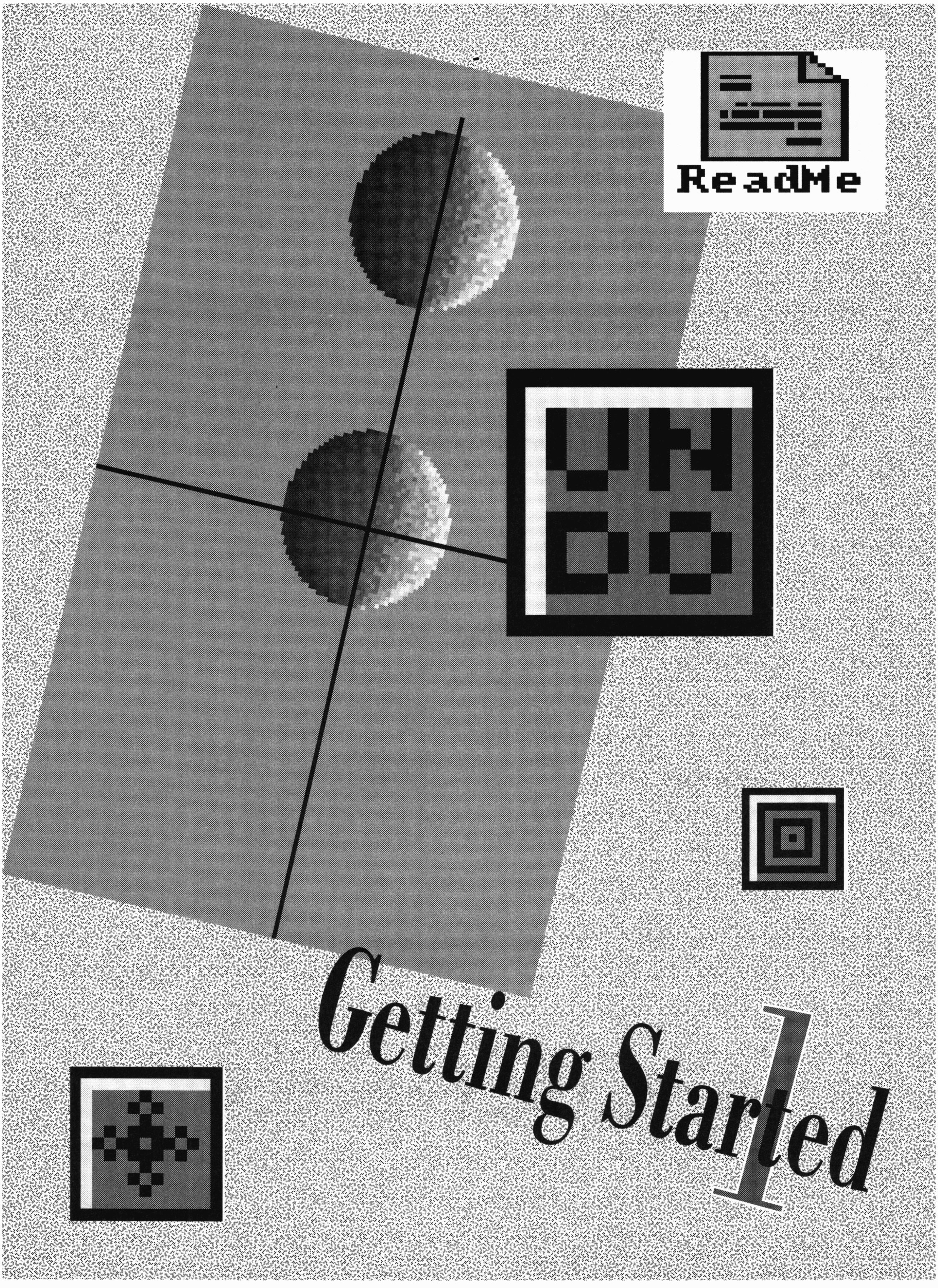
- There are two new styles of Color Cycling. You can now use colors that are not in your palette when you create a cycling range, or you can cycle a single color register through many colors. You'll find explanations and examples of Color Cycling in Chapter 4, ***Painting Tutorials.***
- **Stencil** in the Effect menu now lets you create a stencil by "painting" an area to mask. With the **Paint** option you can use your current built-in or custom brush with any drawing tool to paint an area you want stenciled.

  In HAM you can adjust the extent of your stencil by setting a Tolerance level in the Make Stencil requester.
- DeluxePaint IV's Overscan options go beyond giving you a page that is the right size for an overscan image. It gives you the ability to paint on an Overscan screen! You'll love it if you do video work. Just select Std or Max from the Overscan edit box in the Choose Screen Format requester. You'll find additional information in ***Reference*** and scattered through the manual in discussions of screen formats.

Assorted Other Changes

To take advantage of other capabilities we've provided some new menu options. This is a list of changes you should be aware of. If you want to know more, you'll find information about these in ***Reference***.

- The Prefs menu contains a new option, named **FastAdjust**. This option is only available in HAM, where it is the default. With this option selected, your custom brushes move on the screen more quickly. See this option under the Prefs menu in ***Reference*** for more information.
- There is a new brush mode—**Mix**. The color of your brush interactively mixes with the colors already on the screen. This mode is particularly effective in HAM.
- You can now **Load** 256-color ILBM pictures into DeluxePaint IV. By default, these files load into 64 color mode, but you can also load them directly into HAM mode, where the colors of the original image are best preserved.
- Improved File requesters. Among other features, double-clicking in requesters to load, save, and delete files is now supported. See **Load** under the Picture menu in ***Reference*** for more information.


ReadMe
UN
DO

1

Getting Started

Chapter 1: Getting Started

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What's Next? ***20***

This chapter briefly describes the contents of your DeluxePaint package and the computer hardware and software you will need to use the program. It also describes how to:

- Organize your disks
- Install DeluxePaint on a hard drive
- Start DeluxePaint
- Open a file
- Quit the program

Software

Your DeluxePaint package contains three (3) floppy disks.

- The *Program* disk contains the DeluxePaint IV program, Color Text, Preferences, Install DPaint, and a ReadMe file.
- The *Art1* disk contains pictures, brushes, example moves and color sets, and two color fonts that you can use in your own work.
- The *Art2* disk contains more art, a few animation files and some AnimBrushes to give you ideas of what you can do with DeluxePaint IV's animation features, and the animation Player. The Player program lets you play your animations outside of DeluxePaint IV (you'll find information about the Player in ***Appendix C***).

The ReadMe File

Before you do anything else, read the ReadMe file on your Program disk. This file contains information about the program that was not available before the manual went to press. To read the ReadMe file:

▶ Double-click on the ReadMe icon.

This opens a text window that, at a minimum, lists the title, version number, and copyright information about the program. If you need help using the ReadMe file, press `h` on the keyboard to see a screen of keyboard commands. To exit the ReadMe file:

▶ Press `q` on the keyboard.

Hardware

To use DeluxePaint you need:

- ☐ an Amiga computer with at least 1 megabyte of random access memory (RAM). Two megabytes of RAM (or more) are highly recommended;
- ☐ a monitor (analog RGB or Multisync Monitor recommended);
- ☐ at least one floppy disk drive. Two floppy drives or a hard drive are highly recommended;
- ❖ If your Amiga has only one floppy drive, we recommend that you not double-click on file icons to start DeluxePaint and load a file. Instead, start DeluxePaint and then load the file by choosing Load from the appropriate menu.
- ☐ some initialized floppy disks, or a hard drive for saving your work.

If you want to print the artwork you create, you'll need a printer capable of reproducing black and white or color graphics. Consult your *Amiga Users Guide* for information about connecting printers and other peripherals to your computer.

Organizing Your Disks

We assume that you already know how to initialize and copy disks, create and rename drawers, and move files from one disk to another. If you are not familiar with all of these basic actions, we suggest you consult your *Amiga Users Guide* before going any further.

Copying Your Disks

If you don't have a hard disk, we strongly recommend that you make working copies of the DeluxePaint IV disks. This will help protect the originals from accidental damage, and you will be able to make new copies if necessary. Also, make sure you have one or more blank initialized disks handy for saving your work.

To copy your disks, start your computer with a Workbench disk. Double-click the Shell or CLI icon. At the prompt, type the following:

```
DISKCOPY FROM DF0: TO DF1:
```

This assumes you have two disk drives called DF0: and DF1:. Please see your Amiga user manual for information of copying disks using only one disk drive.

Installing on a Hard Disk

If you use a hard disk drive, you will probably want to install DeluxePaint on it. The following steps assume that you started the computer with a standard Workbench that has been configured properly to support a hard disk.

IMPORTANT! You'll need 400K of available disk space and 10K of available RAM to install DeluxePaint IV on your hard drive.

The install program will install DeluxePaint IV to a drawer of your choice, and lets you copy the program fonts, which need to be installed in your system, in your FONTS: drawer.

1. Create a drawer named DPaintIV on your hard disk.
2. Insert the DeluxePaint Program disk into any disk drive.
3. Double-click the Program disk icon to see the window, which displays the contents of the Program disk.
4. Double-click the Install DPaint icon. This initiates the DPaint IV Installation Script.
5. Type `y` (for yes) and press Return to continue the installation.

   You'll be prompted to enter the name of the directory in which you wish to install the program.

6. Type the name of the partition of your hard drive, followed by a colon and the name of the DeluxePaint drawer you just created (DPaint IV).

   For example, if your hard disk is named dh0, and you wanted to install the program in the drawer you created in step 1, you would type: `dh0:DPaintIV` and press Return.

7. The Installation Script reports what has been copied to your hard disk, and displays a message about custom fonts. Type `y` to install the DeluxePaint fonts to your system's FONTS: directory.

   You'll receive the message "Installation complete!"

IMPORTANT! We recommend that you install the DeluxePaint fonts to your hard drive's FONTS: directory. If you choose *not* to follow this recommendation you must edit your start-up sequence for DeluxePaint to run. To edit your start-up sequence, follow the steps in the gray box below *AFTER* you have completed the 12 steps listed here for installing the program to your hard disk.

ColorText

8. If you plan to use color fonts, drag the Color Text icon to the DPaint IV drawer on your hard disk.

Note: If you are using Amiga DOS 2.0, you do not need to run ColorText because it is already supported by your system.

- ❖ Drag only the DeluxePaint Program and Color Text icons to the new drawer. *Do not drag Install DPaint or Preferences onto your hard drive as they are not needed to run DeluxePaint.*

9. When the copy is complete, eject the Program disk and insert the DeluxePaint Art1 disk.
10. Double-click the Art1 disk icon to view the contents of the disk. Click the Picture drawer to select it. Then press and hold down the Shift key and click the Brush drawer to select it. Repeat this procedure with the following drawers: Colors, Move, Karafonts, and Empty. Drag all the drawers to the DPaint IV drawer on your hard drive.
11. When the copy is complete, eject the Art1 disk and insert the Art2 disk.
12. Select and drag the drawer icons into the DeluxePaint drawer as you did the Art1 disk icons in step 8.

You now have copies of the DeluxePaint Program and both Art disks on your hard disk.

Editing a Startup Sequence

1. Start up the CLI or Shell by double-clicking on the appropriate icon (probably in your System drawer).
2. Follow the instructions in your *Amiga User's Guide* to enter and edit the start-up sequence.
3. Type `assign DPaintIV: hard drive name:drawer name` into your start-up sequence.

   For example, if you hard drive is named speedy and your drawer is named DPaintIV, you would type:

   ```
   assign DPaintIV: speedy:DpaintIV
   ```
4. Exit the start-up sequence and return to the Workbench.

Using a Floppy Drive

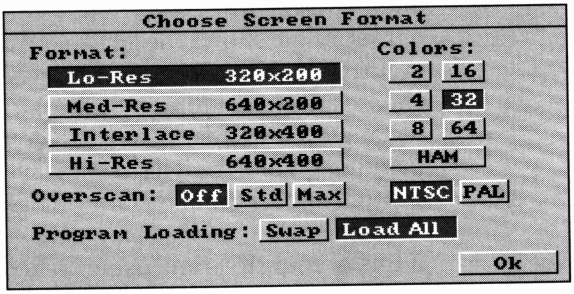
- ▶ Turn on your computer and monitor. (Amiga 1000 users, start by inserting the Kickstart disk [1.3 or later] in the internal drive.) When the request for the Workbench disk appears on the screen, insert your *working copy* of DeluxePaint.

- ▶ Double-click the DeluxePaint disk icon to open the disk window.

Starting DeluxePaint IV

▶ Double-click the DPaint program icon to run the application.

When you start DeluxePaint, the program presents a *requester* (a window that requires some input from you) inviting you to select a screen format. We'll be looking at some of these options later, but for now note the settings that are already highlighted in blue. These are the *default* settings, the ones the program automatically uses unless you specify otherwise.



Choose Screen Format

Format:
Lo-Res 320x200
Med-Res 640x200
Interlace 320x400
Hi-Res 640x400

Colors:
2 16
4 32
8 64
HAM

Overscan: Off Std Max
NTSC PAL

Program Loading: Swap Load All

Ok

Figure 1.1 Choose Screen Format Requester

▶ If your computer has more than 1 MB of RAM, click OK to use the default settings.

❖ If your computer has only 1 MB of RAM, we recommend that you click the Swap button and then click OK, so the program loads in Swap mode.

You'll see the Workbench screen for a moment, then the Painting Screen appears.

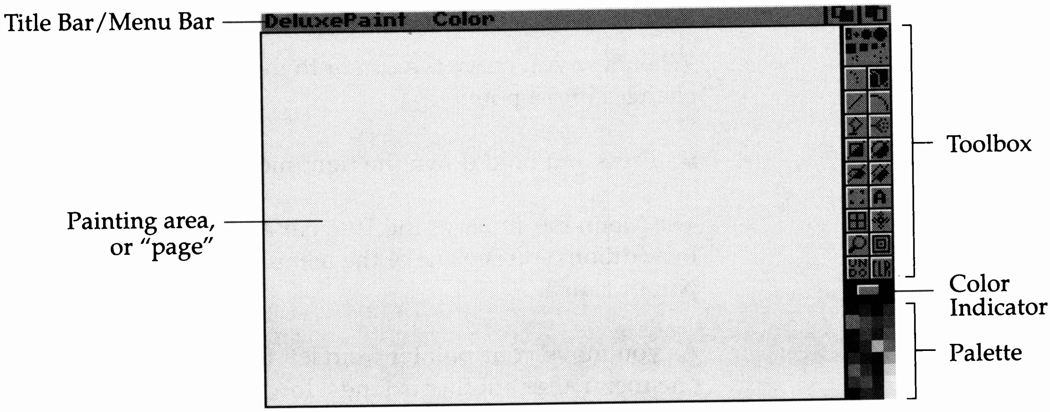


Figure 1.2 Painting Screen

The Painting Screen is your canvas or paper. It's where you'll create, color, edit, and manipulate your art. Animations you load from disk also appear here.

The Toolbox contains the brushes, shape tools, and tool-modifiers you'll use to create and edit your artwork. You can select a tool by clicking on it.

The Palette contains the colors representing a portion of your current color spectrum (sometimes called a *color universe*). This is where you select the color you want to paint with.

Directly above the Palette is the Color Indicator. The two rectangles display the colors you're currently using to paint. The inner rectangle shows the *foreground* color — the color your brush is currently using. The default foreground color is gray. You can choose a different foreground color by clicking on it. The outer rectangle shows the current *background* color — the color you are painting on or over. This color is black by default. You can choose a different background color by right-clicking on it.

If this is your first time using DeluxePaint, we recommend you work through the next chapter, where you will learn how to use many of DeluxePaint's tools and techniques.

Loading a Picture

Before we leave this chapter, let's load a picture so you can see how it's done. Let's load the one called Venus.

❖ Venus is on the DeluxePaint Art1 disk. If you don't have a hard drive (so that the files from the Art disk are not in the DPaintIV drawer on your hard drive), make sure your copy of the Art disk is in one of your floppy drives.

▶ Move your cursor to the top of the screen so that it is over the Title Bar.

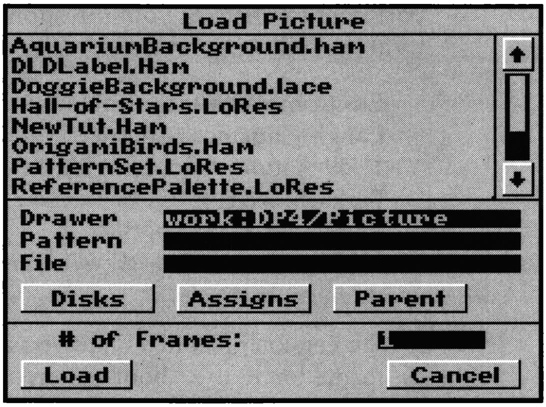
Whenever you move the cursor to the Title Bar, the cursor changes into a pointer.

▶ Press and hold down the right mouse button.

The Menu Bar replaces the Title Bar and you see a row of menus. In addition, you see one of the menus extending down into the painting area.

As you move your pointer from left to right along the Menu Bar, one menu after another extends down, each one displaying its options. We'll be looking at each menu item in detail later, but for now we just need to use the first two options from the leftmost menu, the Picture menu.

▶ Hold down the right mouse button, and drag the pointer all the way to the left on the Menu Bar to display the options in the Picture menu. Drag the pointer down to Load, and release the button. This displays the *Load Picture* requester.



Load Picture

AquariumBackground.ham
DLDLabel.Ham
DoggieBackground.lace
Hall-of-Stars.LoRes
NewTut.Ham
OrigamiBirds.Ham
PatternSet.LoRes
ReferencePalette.LoRes

Drawer work:DP4/Picture
Pattern
File

# of Frames: 1

Figure 1.3 Load Picture requester

- ▶ Click <VOL> Art1: in the requester to look at the contents of the Art disk.

  ART1: appears in the Drawer edit field, and the names of six directories appears in the window.

- ▶ Click <DIR> picture: in the requester.

If necessary you could scroll through these file names by dragging the scroll box up and down. Or you could scroll through the names one at a time by clicking the up and down arrows.

- ▶ Click on the file named Venus.LoRes.

Notice that when you click on the file name the name appears in the edit field beside File. If you wanted, you could type the file name into the edit field, though it is usually easier to click it.

- ▶ Click Load.

The disk drive spins for a few moments, and then the picture appears on the screen.

Quitting DeluxePaint

To exit DeluxePaint, choose **Quit** from the Picture menu. If you have made changes to the Venus image since it was last saved, DeluxePaint will ask whether you want to save your current changes. If you wish to save your changes before quitting, click Yes. (You'll find instructions on saving documents in the next chapter.) To exit without saving changes to the image, click No.

Technical Support

If you have questions about operating DeluxePaint, and you can't find the answers in this manual, our Technical Support department can help. If your question is not urgent, please write to us at the following address:

Electronic Arts Technical Support
Langley Business Centre
11-49 Station Road, Langley,
Berks, SL3 8YN

Please be sure to *include the following information* with any correspondence:

☐ the version of DeluxePaint you are using (You'll find this information in the About option of the Picture menu;

☐ the Amiga model you are using (500, 1000, 2000, etc.);

☐ your Kickstart and Workbench version numbers;

☐ amount of random access memory (RAM) installed in your Amiga

☐ additional system configuration notes (for example, number of disk drives, type and make of monitor, printer, etc.)

If you would like to speak to someone directly, call us on (0753) 549442 Monday through Friday between9:00 am and 6.00 pm. Again, please be sure to have information about your version of DeluxePaint and your computer handy when you call. This information will help us help you more quickly.

If you live outside of the United Kingdom, you can contact one of our other offices.

In the United States, contact:
Electronic Arts
P.O.Box 7578
San Mateo, CA 94403-7578
Phone (415) 572-ARTS

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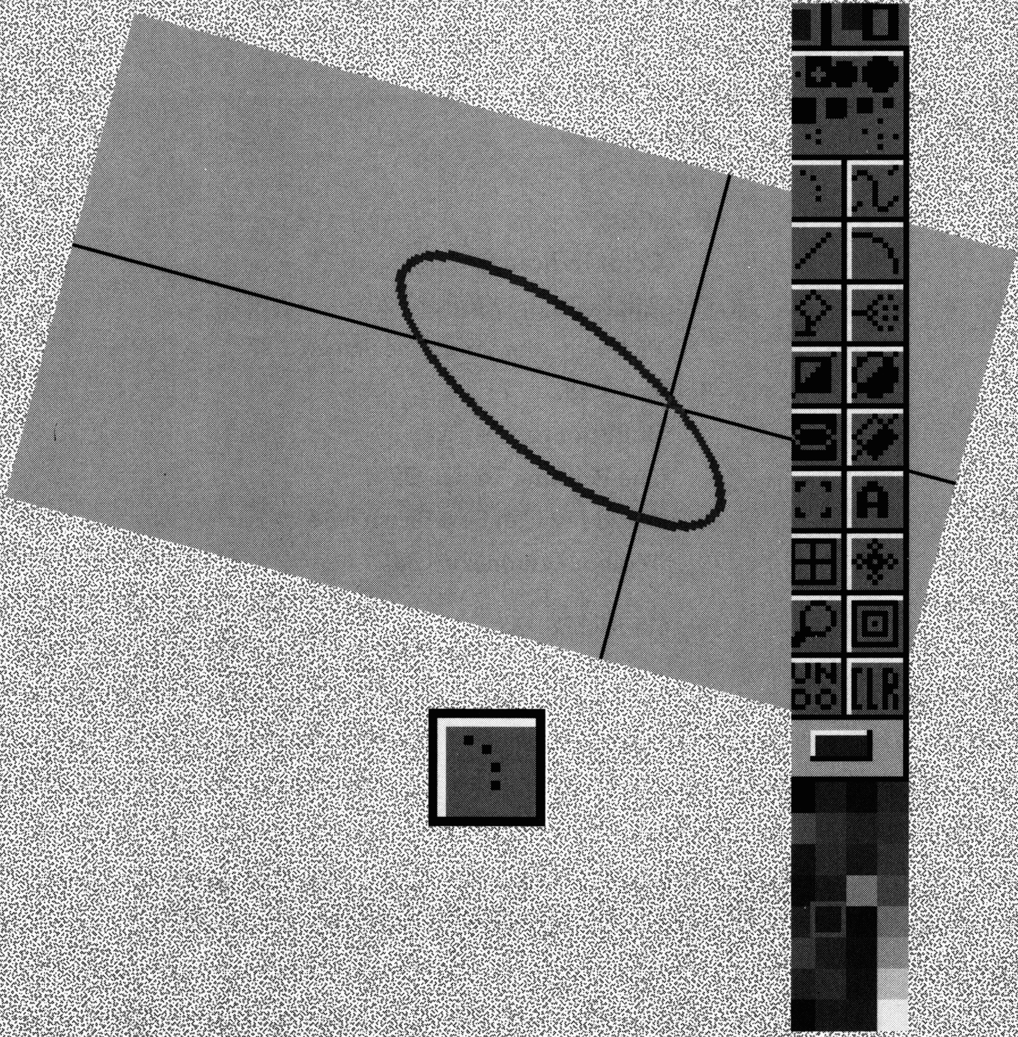
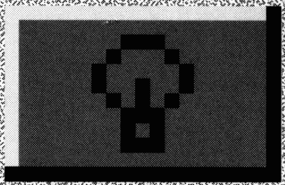
Ashmore City, QLD 4214
Phone: 008-074-277

What's Next?

The next chapter, ***Guided Tour (1)***, introduces you to many of the fundamental features of DeluxePaint IV. We've designed the exercises there to be both easy and informative. If DeluxePaint is the first high-quality paint program you've used, we recommend that you go through all the exercises, in order. This will give you a solid foundation that you can build on when you move on to other parts of the program. Experienced graphic artists should at least page through the ***Guided Tour***.



Guided Tour 2(1)



Chapter 2: Guided Tour (1)

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- Menus ***24***
- Palette ***25***
    - Color Indicator ***25***
- Painting with the Mouse ***26***
    - Picking Colors from the Screen ***27***
- Toolbox ***28***
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Saving Your Work **38**

The next two chapters take you on a tour of DeluxePaint IV's basic features. They serve as an introduction to the program's painting tools, and provide several advanced painting techniques using simple step-by-step instructions.

If you are a relative newcomer to computer graphics, we recommend that you work through these chapters from beginning to end. If you are an experienced computer artist, you might quickly review the material to become familiar with DeluxePaint IV's unique paint features. Once you are comfortable with the program, you can turn to Chapter 4, ***Painting Tutorials***, to learn more about graphic techniques, or go off on your own if you wish. Use Chapter 8, ***Reference***, to answer any questions that might come up.

In this chapter you'll learn how to:

☐ Start a new DeluxePaint IV picture
☐ Select basic tools and paint with them
☐ Create, edit, and move objects
☐ Modify the screen, selected shapes, and tools
☐ Create a custom brush
☐ Save your work

❖ The step-by-step instructions in the Guided Tour, assume that you are using DeluxePaint on a floppy system. If you have installed all four DeluxePaint disks on your hard drive, *you won't have to insert your copies of the various program disks when we request them.*

Painting Screen

▶ Start DeluxePaint IV. If you need a reminder of how to start the program, see *Starting DeluxePaint IV* in Chapter 1.

▶ Click Ok in the Choose Screen Format requester to use the program's default settings—Lo-Res, 32 Colors.

After you have selected your screen format, the Painting Screen appears.

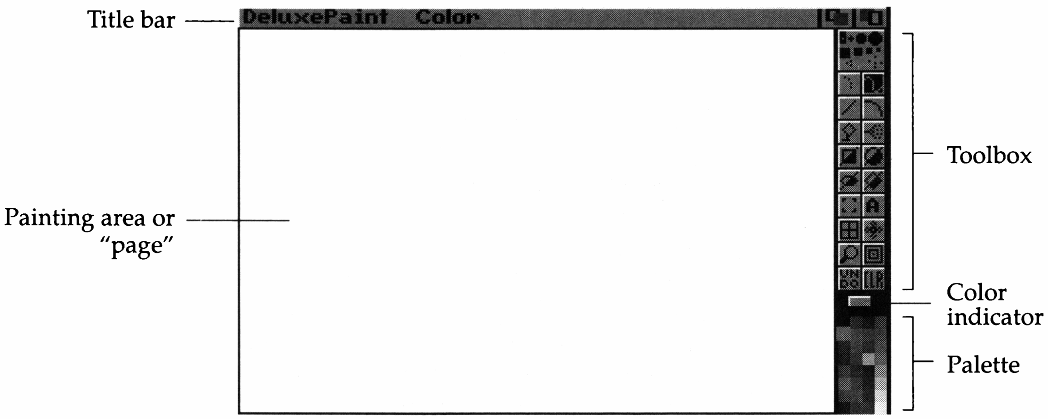

Title bar
DeluxePaint Color
Painting area or "page"
Toolbox
Color indicator
Palette

Figure 2.1 The Painting Screen

The area to the left of the Toolbox is called the *page* or painting area. The normal page size is the same as the screen size.

❖ In the next chapter, ***Guided Tour (2)***, you'll learn how you can make the page larger than the screen. See *Page Size.*

Title Bar

The Title Bar lists the name of the program and the current brush mode.

DeluxePaint Color

Figure 2.2 Title Bar

It also reports whether or not you are using certain program options. For example, if you choose to see the coordinates of the mouse, the current fill type, or angles of rotation, you can turn those features on, and see that they are active in the Title Bar. See *User Feedback in the Title Bar* in ***Reference*** for more detailed information.

Menus

The menus in DeluxePaint work just like other Amiga menus. To select an option from a menu, point to the Title Bar and press the right mouse button to display the Menu Bar.

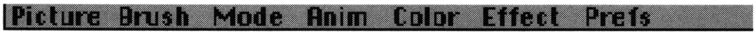


Figure 2.3 Menu Bar

Drag the pointer to a menu name to open that menu. Pull the highlight down to one of the menu options and release the mouse button to select that option.

Palette

You select the color you want to paint with from the palette. The number of colors in the palette depends on the screen format you are using. You'll learn more about screen formats and how they affect the number of colors available when you read the next chapter, or you can skip ahead and look in ***Reference*** under **Screen Format** in the Picture menu.

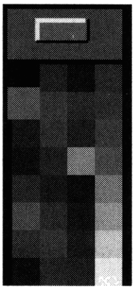


Figure 2.4
Color Indicator
and Lo-Res Palette

The Color Indicator

The Color Indicator looks like one rectangle sitting on top of another. The smaller rectangle shows the *foreground* color. This is the color your brush paints with. You can change this color at any time by clicking one of the other colors in the Palette.

▶ Move the pointer to one of the colors in the Palette and click.

Notice that any changes to the foreground color are reflected in the Color Indicator, and that the color you selected is surrounded by a gray border in the Palette.

The larger rectangle, the page, and the first color in the Palette, are all the same color—black. Black is DeluxePaint's default *background* color. If you were to paint with the background color directly onto the background, it would appear to have no effect, as if you were applying black paint to a black page. Painting with the background color is a way of erasing an image on the page.

You can change the background color at any time by right-clicking one of the other colors in the Palette.

▶ Move the pointer to one of the colors in the Palette and right-click.

❖ Although the larger rectangle is now filled with the new background color, the painting area (page) is still the old background color. This is because DeluxePaint assumes that you want to maintain the old background color as a "wash" over the new background color. DeluxePaint will keep the old background color in place until you clear the painting area. Try it now.

▶ Click the Toolbox icon labeled CLR directly above the Palette. This clears the screen of the old background color and replaces it with the new one.

UNDO

Before going any further, let's look at UNDO, one of the most important tools in the Toolbox. Clicking UNDO will generally "undo" your last painting action.

▶ Click UNDO now to bring back the old background color.

UNDO reverses your last action, provided there has not been an intervening mouse click. For example, if you were to click CLR twice, UNDO would not reverse the clear command.

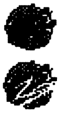
Painting with the Mouse

Now that you've seen how to choose colors from the Palette, let's use a brush to create our first freeform drawing.

▶ Select foreground and background colors from the palette. Choose contrasting colors, such as blue for the foreground and light gray for the background.

▶ Click CLR to cover your page with the new background color.

▶ Move the pointer over to the page, where it turns into a cross hair with a dot (the brush) in the center of it.



▶ Hold down the left mouse button, and draw a small circle on the screen. Don't worry about quality for the moment. Fill in the circle with the foreground color. Release the mouse button to stop painting.

▶ Now press the right mouse button and draw all over your filled-in circle.

❖ The right mouse button has the effect of erasing your drawing, although what you are really doing is painting over it with the background color. This is called *erasing to the background.*

Reminder Follow this simple rule: use the left mouse button for painting with the foreground color, and the right button for painting with the background color. This parallels the rule we noted above for selecting colors from the Palette: select the foreground color by clicking with the left button and the background color by clicking with the right button.

Picking Colors from the Screen

So far you've been selecting your colors by clicking them in the Palette. DeluxePaint also lets you select colors directly from the screen. This is useful if you are working on fine details, or if you are working with many shades of the same basic color. For example, if you are painting a rose using eight different shades of red, it might be easier to pick the color you need directly from the screen rather than choosing it from the Palette.

- ▶ Click anywhere in the Color Indicator and move the pointer back to the screen. The pointer changes to an eye dropper cursor. Point to a color on the screen and click either the left or the right mouse button to select a new foreground or background color respectively.

Keyboard Eqivalents An even easier way to select a color from the screen is to use a keyboard equivalent. *Keyboard equivalents* are shortcuts for doing something you would otherwise do with the mouse. In this case, it might be tiresome to click the Color Indicator every time you wanted the eye dropper to choose a color from the picture. The shortcut is to press the comma (,) key to get the eye dropper, and then click a color. By using the keyboard equivalent, you never have to move the cursor from your picture.

Practice painting with the mouse for a while and try selecting colors from the screen. Remember, you can always click UNDO to reverse your last action, or CLR to clear the screen and start afresh. As soon as you're ready, move on to the next section, where we will be examining DeluxePaint's collection of brushes and tools.

Toolbox

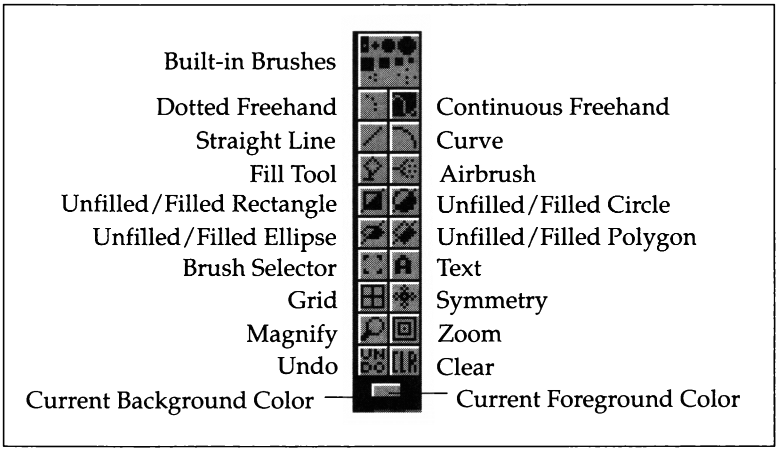

Built-in Brushes
Dotted Freehand
Continuous Freehand
Straight Line
Curve
Fill Tool
Airbrush
Unfilled/Filled Rectangle
Unfilled/Filled Circle
Unfilled/Filled Ellipse
Unfilled/Filled Polygon
Brush Selector
Text
Grid
Symmetry
Magnify
Zoom
Undo
Clear
Current Background Color
Current Foreground Color

Figure 2.5 Toolbox

Built-in Brushes

So far you've been painting with the single pixel brush that's selected when you start the program. It is the default brush. Pixel is short for picture element. A pixel is the smallest unit you can see on the screen.

The DeluxePaint Toolbox includes ten built-in brushes: four round ones, four square ones, and two made up of a number of separate pixels.

▶ To select a brush, move the pointer over the desired brush shape and click.

Clicking a brush shape highlights it to indicate that it is the currently selected brush. As you'll see below, this convention applies to all the other tools in the Toolbox.

❖ You can enlarge or reduce the size of the current brush without continually returning to the Toolbox. Press the equals (=) key to increase the size of the brush. Press the minus (-) key to reduce the size of the brush.

Another way to size your built-in brush is to click on it in the Toolbox with the right mouse button. This gives you a SIZE cursor. With the cursor on the page, hold down the left mouse button and drag the mouse to size the brush. When your release the mouse button, your brush is the new size.

▶ With your new brush selected, paint as before, using the left button to draw with the brush color and the right button to draw (or erase) with the background color.

In the next section we will be looking at the other drawing tools and seeing how they interact with the brushes.

The Painting Tools

The ten icons below the built-in brushes (in two columns of five) control the painting tools. Because any brush can operate with any given painting tool, you have a wide variety of combinations at your fingertips.

IT'S A RULE *To select a painting tool, click on it.*

We'll describe the tools in order, moving left to right and top to bottom:

The Dotted Freehand tool allows fast freehand drawing. No matter how fast you draw, this tool keeps up with you, making it ideal for sketching out a shape quickly before concentrating on the intricate details. Note, however, that the faster you go, the bigger the gaps in your drawing. Once you have roughed out a shape, you can refine your image using some of the other tools at your disposal. Try drawing with it using some of the other brushes to get a feeling for how it works.

The Continuous Freehand/Freehand Shape tool paints unbroken lines, but it doesn't keep up with you if you draw fast. It's better suited than the Dotted Freehand tool for slower, more precise drawing.

▶ Try the Continuous Freehand tool with different brushes and see how brush size affects speed. The smaller the brush, the better it is at keeping up with your painting strokes.

Notice that the Continuous Freehand tool icon has a diagonal line running from its top right to its bottom left corner. This is because it is actually two tools in one — the top left one draws unbroken freehand lines, while the one at bottom right creates freehand shapes filled with the current foreground or background color.

To create a filled shape:

▶ Click the lower right part of the Continuous Freehand tool and paint any shape.

When you release the mouse button, the shape you painted is filled with either the foreground or background color, depending on which mouse button you pressed when you painted the shape. If you release the mouse button before you close the shape, DeluxePaint closes the shape for you with a straight line from your cursor position to where you began the shape.

The Straight Line tool lets you draw straight lines of any length and angle just by dragging the mouse.

- Select the Straight Line tool, and then move the cross hair to the point on the page where you want the line to begin.
- Now hold down the left mouse button to anchor the line at that point, and, drag the mouse to the point where you want the line to end.

When you release the button, you have a straight line in your selected brush color and brush size. You can also draw straight lines with the background color by using the right mouse button.

The Curve tool draws a curved line between two points on the painting area. It works just like the Straight Line tool except that it requires an additional mouse click to complete the shape.

- Select the Curve tool and move the cursor to the painting area.
- At the spot where you want to begin the curve, press the mouse button to anchor the shape. This is the first endpoint.
- Drag the line to the point where you want the curve to end (the second endpoint), and release the button.
- Slowly move the cursor away from the endpoints.

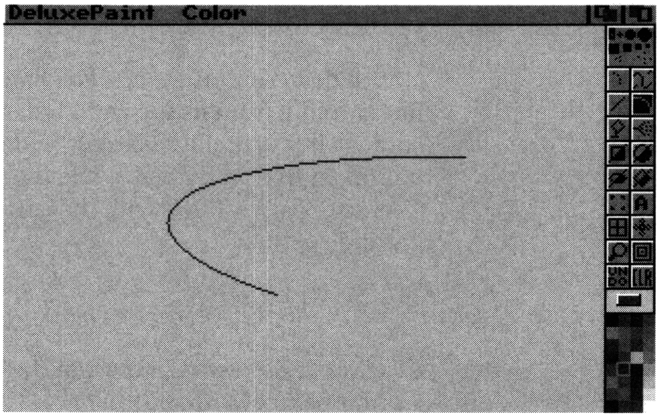


Figure 2.6 Painting Curves

You'll notice that the line is still "active," and forms an arc between the endpoints. The line will curve to follow the cross hair wherever you move it.

- When the curve is the shape you want, click to freeze it at that position.

With a little practice, you'll be able to make curves of any shape and size, giving you much more flexibility than any collection of plastic templates with their limited selection of shapes and sizes. Try joining a series of curves to make flowing shapes with changes in curve direction.

The Fill tool fills any enclosed shape with the current foreground or background color.

- Select the Continuous Freehand Shape tool.
- Draw an enclosed shape, a circle for example, with the largest round built-in brush.
- Select the Fill tool, and move the cursor (which now looks like a paint can) to the enclosed shape. Click to fill the shape.

You can fill with the current foreground color by clicking the left button, or with the current background color by clicking the right button.

❖ The Fill tool fills all the way to the boundaries of an *enclosed* shape. If the shape is not completely enclosed, the paint will leak out and fill the entire page. If this ever happens, you can stop the filling process by pressing the *space bar*. This aborts the current Fill command and returns the screen to its pre-command state.

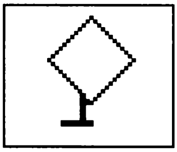


Figure 2.7
The activation point
on the Fill Tool

The paint can spout, the so-called activation point, is the small (one pixel) gap at the base of the Fill cursor. You must put this part of the tool inside the enclosed shape before you click to fill. With careful maneuvering, you can fill a space as small as one pixel, so long as the point coincides with that space.

DeluxePaint has a full-featured airbrush with adjustable tips and nozzles. By using the Airbrush in combination with the different brushes, you can create a variety of effects, ranging from a fine one-pixel spray to a coarse spray made with the big brushes. In the following chapter we will see how to adjust the width of the spray, but for now let's try it as is.

▶ Select the Airbrush and try painting with it using the various brushes.

Try it with the three- and five-pixel brushes, and then try it with the big brushes. Note that, just like a regular airbrush, if you press down on the mouse button without moving the mouse, the paint continues to build up in one spot.

The Rectangle tool lets you draw squares or rectangles, either unfilled or filled with the current brush or background color. Like the Continuous Freehand tool, the Rectangle tool has a diagonal line running from its top right to its bottom left corner. Let's try making a few rectangles.

▶ Click the top left half of the icon. Move the pointer onto the painting area, where it changes into a large crosshair.

▶ Hold down the left mouse button to anchor one of the corners of the rectangle, and drag the mouse away from the anchor point.

You can drag the mouse down and to the right (in which case the first button press anchors the rectangle's top left corner), or in any other direction you wish. In any case, the rectangle is completed as soon as you release the button. Note that it is unfilled and bordered by the current foreground color. You can also create an unfilled rectangle bordered by the background color by using the right mouse button.

▶ To create a filled rectangle, click the lower right part of the Rectangle icon and repeat the procedure above.

This time, the rectangles you create will be filled with either the foreground or the background color, depending on whether you pressed the left or right mouse button.

Making Squares

If you hold down the Shift key as you draw with the Rectangle tool, you can constrain the rectangle so that its height and width are equal.

❖ Because the Amiga's pixels are not perfectly square, "constrained" rectangles will not appear square on the screen. You can compensate for this at the printing stage, or by selecting **Be Square** from the Prefs menu.

The Circle tool works like the Rectangle tool. Select the top left part of the icon to get an unfilled shape; select the bottom right to get a filled shape. Whether your circle is drawn in the foreground or background color depends on which mouse button you press down while you draw.

Circles are painted from the center outward, so it's easy to put a circle around anything just by starting to paint from where you want the center of the circle.

The Ellipse tool works just like the Circle tool, except that the shape is still "active" after you release the mouse button.

- Select the Ellipse tool. Remember, top left for unfilled, and bottom right for filled shapes!
- Move the pointer to the painting area, and draw an ellipse by dragging the mouse. Release the button.
- Slowly move the mouse. Even though you have released the button, the ellipse continues to change shape as you move the mouse.
- When your ellipse is the shape and size you want, press down the mouse button and hold it there.

Now you can rotate your ellipse until it has just the right tilt.

- Drag your cursor around the ellipse and watch your shape rotate. When it is in just the right position, release the mouse button. The menu bar displays the angle of rotation.

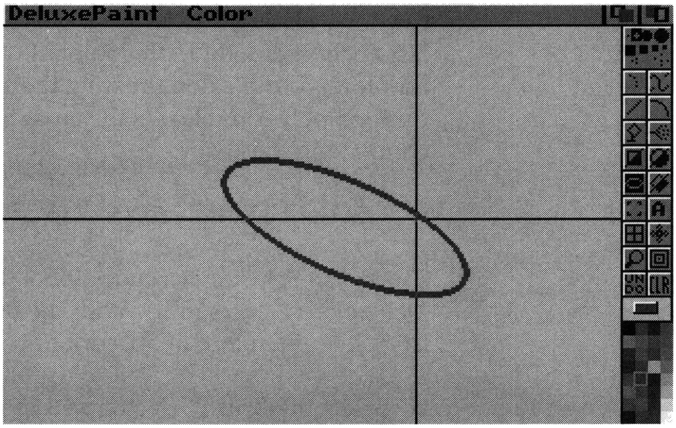


Figure 2.8 Rotated Ellipse

When you complete your ellipse, the small cross hair changes into the large cross hair to let you know that DeluxePaint is ready for the next ellipse.

The Polygon tool lets you keep drawing straight lines until you have created a closed figure. Like the Rectangle, Circle, and Ellipse, the Polygon tool can create both filled and unfilled shapes. Here's how it works.

▶ Select the Polygon tool.

▶ Move the cross hair into the painting area and click once to anchor the starting point of your polygon.

▶ Drag out a line, and click a second time to complete the first line, as if you were using the Straight Line tool.

You'll notice that your cross hair is still connected to the first line by a second straight line.

▶ Click again to finish that line, and so on until you have created your shape.

To complete the polygon:

▶ Move the cross hair to your starting point, and click.

If you are creating a filled polygon, it will be filled with the current foreground color. If you right-click on the starting point, you'll fill with the current background color.

Tip Because it can sometimes be a little tricky to end up on the exact pixel you started with, you can complete a filled polygon at any time by pressing the *space bar*. This automatically connects the last anchored point to the point of origin and fills it with the current foreground color. Pressing the *space bar* while drawing an unfilled polygon releases the cross hair from the line without completing the shape.

▶ Use the filled Polygon tool to draw several five-pointed stars.

Anything Can Be a Brush

The Brush Selector is a special tool that is an essential part of DeluxePaint's versatility. With the Brush Selector, *anything can be a brush* — any piece of artwork or text you put on the screen.

▶ Select the Brush Selector, and move the cursor over to the painting area.

Your cursor is now a large cross hair that reaches to the edges of the screen. Let's make one of the filled stars you drew with the Polygon tool into a brush.

▶ Put the center of the cross hair to the upper left of the star. Drag the cursor to the lower right of the star, as if you were using the Rectangle tool to enclose the star in a box. Release the mouse button.

When you release the mouse button, the cursor has a copy of the star attached to it. This star is your new brush!

▶ To stamp a star in a new location, simply click. There's no need to stop with one — go ahead and star-spangle the screen.

❖ If any parts of your brush consist of the current background color, those parts will be transparent. In other words, whenever you pick up a brush, it's as if you are picking up only the non-background colors; any background colors in the brush will remain invisible even after you change to a new background color. This means that you can create brushes with intricate outlines without fear of picking up a rectangle of the surrounding background color.

Let's try one more trick.

▶ Click the Brush Selector again and select a star from the painting area. But this time use the right mouse button to drag the cross hair over the star.

Unlike the last exercise, which yielded two stars — one unmoving original, plus the one on your brush — this time you are picking up and moving just the one star. While the first feature lets you copy and move anything on the screen, the second lets you move images from one part of the screen to another, while leaving no trace behind.

DeluxePaint's text editor lets you place text anywhere on the page, and the Brush Selector lets you pick it up and reposition it if you don't get it quite right the first time.

To enter text on the page:

▶ Select the Text tool.

▶ Move the cursor to the page. The pointer turns into the text cursor.

▶ Click where you want to begin a line of text.

▶ Type on the keyboard.

The text will automatically "wrap" around to the next line when it reaches the end of the line.

❖ You can delete text by pressing the backspace key, as long as you HAVE NOT clicked elsewhere on the screen. When you click elsewhere (the Toolbox for example), text becomes a bit-mapped image, and can no longer be edited as text.

Changing Colors

You can change the color of your text as often as you like by choosing a different foreground color from the Palette.

▶ Select a new foreground color and type some more.

To leave the text mode, click on another tool, or press ESC.

You'll learn how to use the Choose Font Requester to select different fonts, type sizes, and type styles in the next chapter, ***Guided Tour* (2)**. See the section *Modifying Tools*.

The Grid lets you apply paint on the page in accordance with an invisible grid and restricts your painting tools to the grid points.

▶ If you need some room to work, click CLR.

▶ Select the Grid, and then click the Dotted Freehand tool. Now paint on the screen.

With Grid and the Dotted Freehand tool selected, you can paint only on the points of the grid, making it easy to fill the screen with a polka-dot pattern (we'll see other methods for pattern design later).

You'll learn how to adjust the spacing between the grid points in the next chapter, ***Guided Tour* (2)**. See the section *Modifying Tools*.

The Symmetry tool lets you paint symmetrically over the entire page at the same time.

▶ Click the Symmetry tool. [If the Grid is selected from the previous exercise, turn it off]. Use the Dotted Freehand tool to paint whatever you like.

Your brush now consists of a number of mirror images of itself. As you move the brush around, all the mirror images move as well, producing an effect much like that of a kaleidoscope. When you paint, you are laying down a number of identical mirror images about a fixed origin. With all tools except the Dotted and Continuous Freehand tools and the Airbrush tool, the mirror images are drawn *after* you release the mouse button. With the Dotted and Continuous Freehand tools and the Airbrush tool, all the images are drawn at the same time.

You'll learn how to customize the Symmetry settings in the next chapter, ***Guided Tour* (2)**. See the section *Modifying Tools.*

You can magnify any section of your work, and view it alongside the standard-sized image. To magnify a section of your work:

- Click the Magnify icon. When you move the cursor onto the page, it becomes a rectangular outline.
- Move the outline to the part of the image you want to magnify, and click.

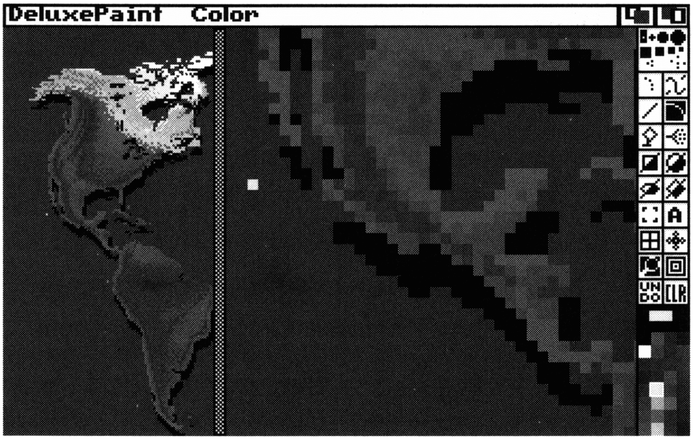


Figure 2.9 Magnified image

The part of the image included in the rectangle now appears magnified on the right part of the screen. You can use any tool to perform any function on either side of the screen. You can scroll around your image using the four arrow keys; this moves the image around under the "magnifying glass." In addition, by pointing your cursor anywhere on the unmagnified portion of the screen and pressing **n**, you can magnify that part of the picture.

Once you have magnified a part of your picture, you can increase or decrease the amount of magnification by clicking the Zoom tool.

- Click the Zoom icon to increase the magnification. Right-click the icon to reduce the magnification.

DeluxePaint's Magnify and Zoom tools let you carry out precision work on your pictures by magnifying each pixel up to 400 times its original size.

- To quit magnify mode, click the Magnify icon a second time.

Toolbox Summary

This completes our brief review of DeluxePaint's versatile range of tools. You'll find additional and more detailed information about every tool scattered throughout the manual, and gathered in ***Reference***.

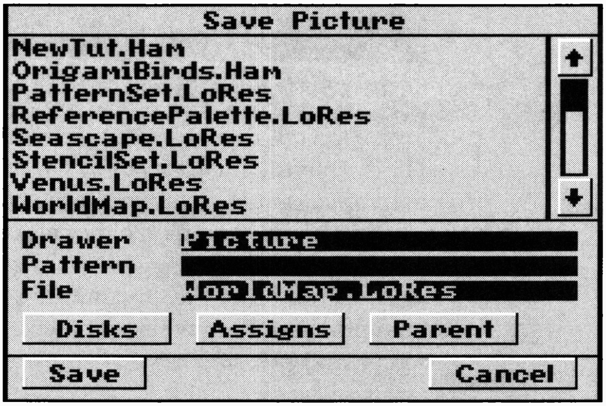
Before we continue our tour of DeluxePaint IV in the next chapter, ***Guided Tour (2)***, take a moment to learn how to save your artwork.

Saving Your Work

It's important to learn how to save the pictures (or "files") you create. We'll begin by saving whatever you drew in the preceding sections.

- ▶ Move the pointer up to the far left side of the Title Bar.
- ▶ Press and hold down the right mouse button. This exposes the Menu Bar and extends the Picture menu.
- ▶ Select **Save**.

The Save Picture requester appears.



NewTut.Ham
OrigamiBirds.Ham
PatternSet.LoRes
ReferencePalette.LoRes
Seascape.LoRes
StencilSet.LoRes
Venus.LoRes
WorldMap.LoRes

Drawer Picture
Pattern
File WorldMap.LoRes

Figure 2.10 Save Picture requester

Notice that this requester is like the Load Picture requester in almost every respect. You'll use the Save Picture requester to provide DeluxePaint with the information it needs to save your files in its proper classification. The Drawer edit box tells DeluxePaint which drawer to save the file in. By using drawers to classify your pictures, you can keep related images together, in the same way you keep related papers together in one file folder. For example, the setting might be DF1: lo-res, which means that the drawer exists on a disk in your second disk drive ("DF1") and that the drawer is named "lo-res."

The File edit box is where you enter the name of your picture the first time you save it.

If you want to save your current creation, this is your chance to do so.

- ▶ Insert a blank, formatted disk in any drive, for example, DF1.
- ▶ Click the Disks button. The name of the drive that contains the blank disk should appear in the window (<DEV> DF1:).
- ▶ Click on the disk name in the window. In our example DF1: appears in the Drawer edit box.
- ▶ Click anywhere in the File edit box and type in a name for your new file.
- ▶ Click Save.

The disk drive will spin for a few moments; when the red light goes out, the file is saved.

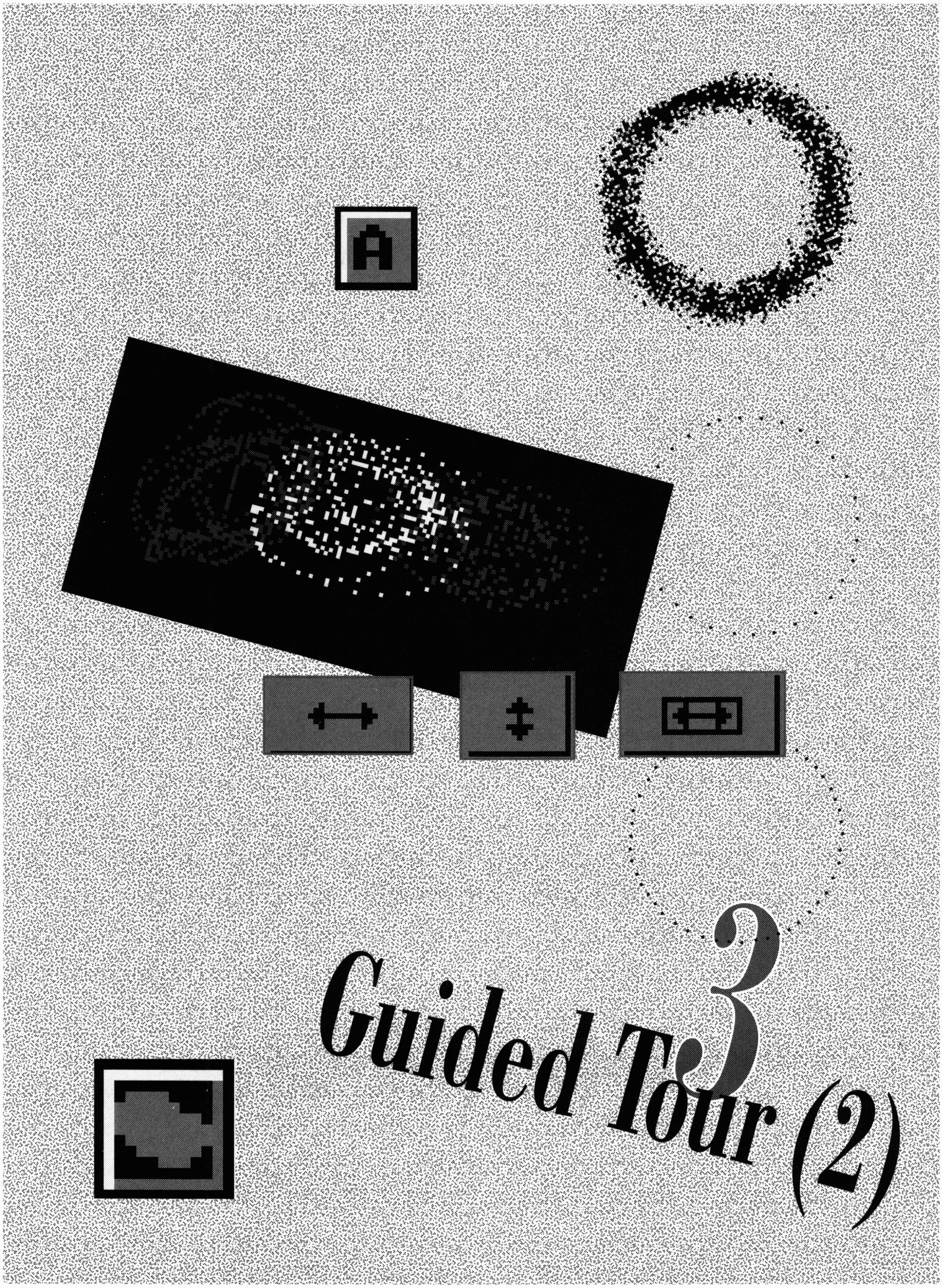
The next time you save this file (it's a good idea to save work in progress every 15 minutes or so, so that a power failure or other breakdown doesn't turn hours of work into a bitter memory), the Save Requester uses this same information, which means you won't need to type anything more unless you want to change the file name. You might want to do this to save it under another name, if you want to save each version as a separate file. In that case, you would click the File edit box as before, backspace over the old file name (or over those parts you wish to change) and type in the new name. Or you could just keep adding suffixes, such as 1, 2, 3, etc., to signify succeeding versions.

You can specify drawer names in the same way: click in the Drawer edit box, backspace over the old name, and type in the new name. You can open any drawer already on the disk, but you cannot create one from the Save Requester. See your *Amiga User Guide* for information on creating new drawers.

For more information on all the options available from the Load and Save requesters, see ***Reference***.

Right now you might want to take a break. When you're ready, move on to the next chapter, ***Guided Tour (2)****, where you'll learn how to modify tools and work with many other powerful features of DeluxePaint.*

Notes



3

Guided Tour (2)

Chapter 3: Guided Tour (2)

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This chapter continues the tour of DeluxePaint's painting tools. It concentrates on the program's sophisticated editing tools, describes tool modifiers, previews the Anim menu, and introduces several painting techniques using simple step-by-step instructions.

If you are a relative newcomer to computer graphics, we again recommend that you work through this chapter from beginning to end. If you have some experience with computer graphics software, you can probably become familiar with this material quickly. You can use this chapter to learn how DeluxePaint handles features you have encountered in other programs. Feel free to skip around and read only those sections that interest you at the time.

When you are comfortable with the program, turn to Chapter 4, ***Painting Tutorials***, to learn how the program creates and handles color, or Chapter 5, ***Working with Perspective***, to learn more about DeluxePaint's graphic power. If you go off on your own, use Chapter 8, ***Reference***, to answer any questions that might come up.

In this part of the Guided Tour you'll learn how to:

☐ Create and edit custom brushes
☐ Manipulate the variety of program screen formats
☐ Modify tool functionality and operation
☐ Mix and cycle colors from the Palette
☐ Use keyboard equivalents *with the mouse button down.*
☐ Use the various painting modes
☐ Control AnimBrushes and Animpainting

What You'll Need to Continue the Tour

To complete the examples in this section, you'll need your working copies of the DeluxePaint Program, and both Art disks. If you want to save your work, you'll need an initialized disk with a fair amount of available space for saving large files.

❖ The step-by-step instructions in the tour assume that you are using DeluxePaint on a floppy system. If you have installed all three DeluxePaint disks on your hard drive, *you won't have to insert your copies of the DeluxePaint disks when we request them.*

▶ Start DeluxePaint and use the default screen format settings. If you already have the program running, we recommend that you restart so that the tools and option settings are all set to their defaults.

Custom Brushes

As we saw in ***Guided Tour (1)***, DeluxePaint's "anything can be a brush" feature lets you select any image on the screen and define it as a brush. If you wish, you can keep a selection of brush images on the spare page (see **Spare** in the Picture menu) and move them over to the main page by picking them up as brushes. Or you can have one spare custom brush in RAM (see the **Spare** option in the Brush menu). In addition, you can load and save brushes as though they were pictures.

Creating a Rectangular Brush

Here's a reminder of how to create a brush out of an on-screen image:

- Select the Brush Selector.
- Move the cursor to the painting area. The cursor becomes a large cross hair.
- Drag the cross hair to form a rectangle around the image you want to pick up. When you release the mouse button, an exact copy of the image is attached to your cursor.

REMEMBER! When you drag the Brush Selector with the left button held down, DeluxePaint makes a duplicate of the image and attaches it to the cursor, while leaving the original image in place on the page. If you use the right mouse button to surround the image, the image itself becomes the brush, as if the original image had been lifted up off the page. This technique provides an ideal method for picking up objects and moving them around the page as you experiment with different compositions. See also *Fixing the Background,* below.

Paint with your new brush or use it to create filled or unfilled shapes, just as you would with any of the built-in brushes.

Creating a Brush with an Irregular Shape

Though it's often convenient, you don't have to create a rectangular brush. DeluxePaint lets you you corral any image, so you can pick up shapes from a "crowded" background, and make a brush in any shape you wish. Here's how to corral an image:

- If the Brush Selector icon is highlighted, click it again. If it is not selected, double-click it.

  The Brush Selector icon changes to a polygon shape to show that the polygon brush selector is active.

- Click around the shape you wish to define, just as if you were making a polygon with the Polygon tool.

As soon as you complete the polygon, the complex shape becomes your new brush.

❖ The left button-right button convention works here, too. Corralling the shape with the left button duplicates the shape, while corralling with the right button lifts the shape off the background. As with the Polygon tool, pressing the *space bar* completes the polygon for you, so you don't have to search for the starting pixel in order to complete it.

Transparent Color

When you pick up a custom brush, some parts of your brush may be transparent. There are two rules for determining which color is transparent:

☐ If **AutoTransp** in the Prefs menu is turned off (the default setting), or if any one corner of the brush is a different color from the others, the current background color is transparent.

☐ If **AutoTransp** is turned on and every corner of your brush is the same color, that color is transparent.

Let's see how these two rules work in practice with a couple of brief examples.

▶ To set up for our example, click black in your palette with the right mouse button to make it the background color, and click CLR to clear your screen.

▶ Use the Dotted Freehand tool to scrawl randomly over the screen using several different colors.

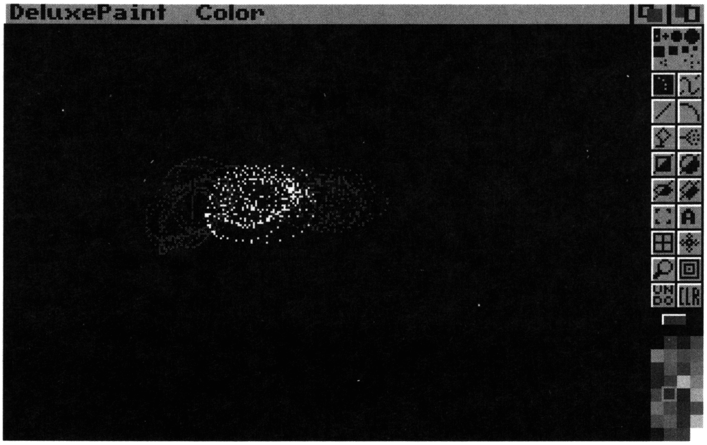


Figure 3.1 Figure in Progress

The Background Color Is Transparent

Now you should have a black screen, because black is your background color, with several colors scrawled over it (see Figure 3.1).

- Click the Brush Selector icon, and move the cross hair to the painting area.
- Select a rectangular area that contains some black.

When you release the mouse button, the black areas of your brush are transparent because black was the background color when you selected the brush. Move the brush around to confirm this: the painting shows through the areas where there used to be black. Any parts of the brush that consisted of background color when the brush was first created remain transparent, even after you change background colors. But if you want to change the transparent color, you can do that, too. We'll show you how in a moment.

The Corner Color Is Transparent

Now let's see what happens when you select an area with all corners the same color.

- Move the pointer to the far right of the Title Bar, and press the right mouse button.

  The Menu Bar appears and the Prefs menu extends down.
- Choose the **AutoTransp** option. Display the menu a second time to confirm that AutoTransp now has an check (√) beside it. This means that it's turned on.
- Double-click the Brush Selector icon to activate the polygonal brush selector.
- Select an area of any shape. Make sure that you always click on the same color, but not on black (since this is the background color and won't illustrate what we want to see).

This creates a brush in which the color you clicked on is transparent because **AutoTransp** is turned on, and all corners of your brush are the same color.

We used the polygonal Brush Selector for our example, but the **AutoTransp** option is especially useful for picking up a shape from any solid background without having to change the current background color.

Changing the Transparent Color

You can change which color in your brush is transparent by choosing a new background color and then choosing **Brush> Change Transparency** from the Color menu. Let's try a quick example.

- Click the Brush Selector and select a rectangular area that contains some of the current background color so that your brush has some transparent areas.
- Choose a new background color by clicking on a color in the Palette with the right mouse button.

Notice that simply changing the current background color does not change the transparent areas of your brush. You accomplish that with the next command.

- Choose **Brush>Change Transparency** from the Color menu.

The transparent areas of your brush change from the areas of the original background color to the areas of the current background color. You can do this as many times as you like to change transparent areas.

A Brush Is a Little Picture

From the Brush menu you can treat brushes just like full pictures. You can **Load** and **Save** them just as you can other pictures. When you load a saved brush, it comes equipped with its own palette and ranges, the ones that were in effect when the brush was first saved. If the current picture is using a palette different from that of the newly-loaded brush, you can change the current palette to the brush's palette by selecting **Palette>Use Brush Palette** from the Color menu. On the other hand, if you want to use the newly-loaded brush with the current palette, select **Brush>Remap** from the Color menu.

Other options in the Brush and Color menus let you resize, reshape, and recolor brushes in various ways.

Your DeluxePaint Art disk contains a number of saved brushes. Let's load one now just to see how it works:

- Insert the Art disk into any drive. Select **Load** from the Brush menu. Click <VOL> Art: in the Save Brush requester.
- Click <DIR> Brush. The Drawer edit box reads Art:Brush.
- Double-click Bobsled and the file will load automatically.
- The Bobsled brush is attached to your cursor, but its colors are not correct.
- Choose **Palette>Use Brush Palette** from the Color menu. Select the Continuous Freehand tool and paint with the brush.

Do you see why this brush is called Bobsled? Feel free to experiment with some of the saved brushes. Select **Palette>Use Brush Palette** whenever you load a brush to ensure that you are seeing it as it was when it was saved.

❖ If you would like to see color cycling in action, load the brush called Fireworks.

1. Select **MultiCycle** from the Prefs menu.
2. Select **Cycle** from the Mode menu.
3. Select **Palette>Use Brush Palette** and then press the Tab key before you start drawing with it.

   "Fireworks" comes complete with color cycling information, and is a spectacular example of the power of this feature. See *Tutorial Two: Working With Ranges* in the next chapter for more demonstrations of color cycling.

Additional Features

The following are some additional features relating to custom brushes.

Handle

This feature, which is available from the Brush menu, allows you to specify where the cursor will sit in your custom brush. In the default setting the cursor sits at the center of the custom brush. When you select **Handle>Corner**, the brush handle moves to the lower right-hand corner of the brush. Each successive choice of the Corner option moves the handle to a different corner.

Once you have selected Corner, the brush handle attaches itself to the *ending* corner when you enclose a brush. For example, if you pick up your brush by dragging downward from left to right, the brush handle will attach itself to the lower right-hand corner, whereas if you pick up the brush by dragging upward from right to left, the handle will attach itself to the top left-hand corner.

The Handle feature is especially important in the perspective mode, because you can rotate a brush about its handle, whether the handle is at the center or on one of the corners.

Perspective

DeluxePaint's **Perspective** feature (in the Effect menu) lets you rotate a brush about any of the three axes of three-dimensional space to define a plane of operation, and then work within that plane to create perspective effects. Perspective is a big subject to cover, so we've provided an entire chapter to cover it, Chapter 5, ***Working with Perspective***. If you are interested in 3D painting or in 3D animation, be sure to work through Chapters 6 and 7.

Fast FB

With **Fast FB** selected (in the Prefs menu), lines, filled shapes, and unfilled shapes are drawn with a single pixel line instead of the full custom brush until you finish drawing, at which point your shape is repainted with the custom brush. Try painting an unfilled rectangle with a custom brush both ways to see how Fast FB works.

DeluxePaint IV Screen

Some of DeluxePaint's features affect the entire screen, while others, such as the tools and the brushes, affect the screen selectively. This section considers those features that have a screen-wide effect.

Hiding the Toolbox and the Title Bar

DeluxePaint lets you paint on the entire screen, even under the Toolbox and the Title Bar.

- ▶ To remove these two items from the screen, press the **F10** key. (Make sure your cursor is not in the Menu Bar area, or the keyboard commands will have no effect.) This removes them both if they are both present. Press **F10** a second time to bring them back.
- ▶ To hide just the Menu Bar (or to bring it back, if it's hidden), press **F9**.

Note that you can still access the Menu Bar even while it's invisible.

- ▶ Move the cursor to the top of the screen (except the upper left corner) and press the right mouse button to display the Menu Bar. You can now select any menu item in the regular fashion.

You can access the tools as well, even with the Toolbox hidden, through the keyboard equivalents. See ***Appendix B*** for a complete list of keyboard commands.

Pages

DeluxePaint gives you two separate pages with which to work. You could use one of the pages for creating background images, and the other for creating foreground images. You could then move parts from one page to the other to complete your composition. When you are working on a picture, the spare page is always the page you are not currently viewing. When you are working on an animation, the spare page is identified with the word Scratch in the Menu Bar; this page can be larger than the screen, even though your animation frames cannot. As we shall see in a moment, the spare page is not entirely independent of the other page or animation frames. For one thing, they share a common Palette, almost as if they were the same picture.

When you first open a new file or load a picture from disk, DeluxePaint opens one of the two pages.

- **Load** any image from the Picture drawer on your copy of the DeluxePaint Art1 disk.
- To move from one page to the other, choose **Spare>Swap** from the Picture menu, or press **j** on the keyboard to "jump" to the other page.

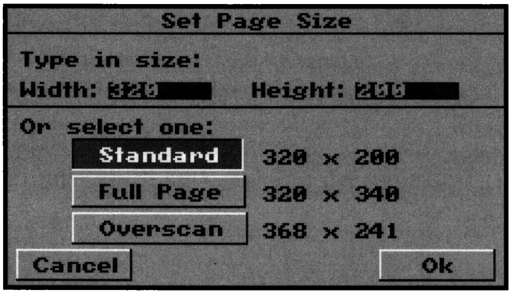
Switching Pages

When you do, you will notice that the Palette from the first page follows you to the *spare* (second) page. This means that if you modify the Palette for one page and then switch to the other page, you end up modifying the second page's Palette as well. Note, however, that although the two pages share the same palette, you can have a different background color on each page. Because the background color is transparent, however, (see discussion under *Custom Brushes*, above) any part of a brush consisting of background color will remain transparent even if you move it to the spare page with a different background color.

In addition, because the Toolbox is not really part of the page (but actually sits "above" it), whatever tools you had selected before you switched will still be selected after you switch pages. This way, you can retain the same tool settings, giving you continuity as you work. Note that this continuity rule does not apply to the Fix Background and Stencil commands, which do not carry over from one page to the other. See the following section for information on fixing the background, and Tutorial Three: The World of Stencils in the next chapter for exercises involving the Fix Background and Stencil features.

Page Size

DeluxePaint lets you work on page sizes ranging from 320 pixels wide by 200 pixels high, to 1008 pixels by 1008 pixels, depending on memory availability. Note, however, that your page size can never be smaller than the current screen resolution. For example, if you are using HiRes 640x400 screen format, your page cannot be smaller than 640x400. In addition to the three preset page sizes (Standard; Full Page; Overscan), DeluxePaint lets you specify any height and width through the Set Page Size requester. To display this requester, choose **Page Size** from the Picture menu.


Set Page Size

Type in size:

Width: 320 Height: 200

Or select one:

Figure 3.2 Set Page Size requester

If you are working on a page size larger than the screen, you can preview the entire page at any time by selecting the **Show Page** command from the Picture menu. Your current work area will appear surrounded by a rectangle. You can move this rectangle to work on another area by holding down the left mouse button, dragging the rectangle, and releasing the mouse button when the area you want to paint is enclosed. You can return to your current page without moving the rectangle by pressing the space bar.

Scrolling the Page

If you are working on a page that is larger than the screen, you can also scroll the page with the arrow keys on the keyboard. Think of them as moving the screen rather than the picture; pressing the down arrow moves the screen down, so it looks like the page is moving up. To scroll the page in screen size increments, hold down the Alt key and press the arrow keys.

A more efficient way to scroll the page is to place your cursor over the area you want to move and press the **n** key. If the page can scroll that far, the area under your cursor will be centered in the screen. If the page isn't big enough to center the area, it will move as far as possible.

Screen Resolutions

DeluxePaint supports four different screen resolutions. You can switch from one to another even during a single work session, but be aware that changing formats in the middle of a job can result in loss of information (such as your current brush, the spare page, the last requester used, etc.). *It's important to save your work before changing screen formats.*

- ❖ You should develop the habit of saving your work every 15 or 20 minutes in any case, but it becomes especially important to do so if you are about to change formats.

As we noted in ***Guided Tour (1)***, you're asked to select a screen format each time you start DeluxePaint, through the Choose Screen Format requester. In addition, you can display the Choose Screen Format requester at any time by selecting **Screen Format** from the Picture menu. Each screen format has its own limitations and memory requirements.

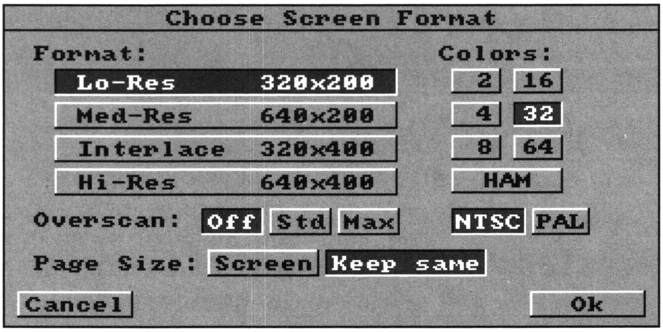

Choose Screen Format
Format:
Lo-Res 320x200
Med-Res 640x200
Interlace 320x400
Hi-Res 640x400
Colors:
2
16
4
32
8
64
HAM
Overscan:
Off
Std
Max
NTSC
PAL
Page Size:
Screen
Keep same
Cancel
Ok

Figure 3.3 Choose Screen Format requester

Palette

This section introduces you to the basics of the Palette. You can learn about the color requesters by working through the tutorials in the next chapter or by reading the relevant parts of the ***Reference*** section (see **Palette** in the Color menu).

Color Mixer

The Color Mixer lets you mix your own custom set of colors from a universe of 4096 colors. You can mix colors using either the RGB (Red, Green, Blue) or HSV (Hue, Saturation, Value) color systems. The number of colors you can work with at any one time is dependent on the screen format and number of colors you selected in the Screen Format requester.

- ▶ To display the Color Mixer, choose **Palette>Mixer On** from the Color menu, or right-click the Color Indicator.

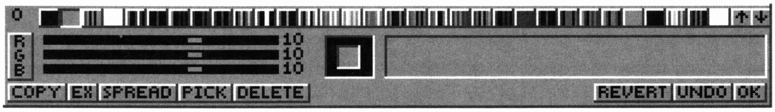


Figure 3.4 Color Mixer

You can quickly modify the currently selected color on any of the three variables (RGB or HSV) by dragging the appropriate sliders left or right.

Arranging Colors in the Palette

EX (for "Exchange") and COPY let you swap or copy colors from one part of the Palette to another.

EX

To exchange the position of two colors: Click a color, click EX, and then click a second color. The two colors exchange places on the Palette.

COPY

To copy a color over another: Click a color, click Copy, and click a second color. This copies the first color into the second

These two functions make it easier to create the *color spreads* for your work.

Creating Spreads

The Palette Requester lets you create color spreads to give you subtle shades of the same hue or equally spaced gradations across hues.

SPREAD

- ▶ To create a spread of colors, click the first color for your spread, click SPREAD, and then click the last color for the spread.

DeluxePaint looks at the first and last colors in the spread and at the number of steps in between, and then calculates the series of intervening shades. For example, if your first color is blue and your last color is yellow, DeluxePaint calculates the intervening shades and hues, to give you a series of blues, blue-greens, greens, yellow-greens, and yellows. Unlike traditional color mixing, if your modifications are not to your satisfaction, you can always reverse the last change by clicking UNDO, or you can cancel all the changes you made by clicking Revert.

Defining Ranges

Good color ranges are important for effective Color Cycling, Gradient Fill, and some Painting Modes. Color Cycling and Gradient Fill are treated in the Tutorial Two: Working with Ranges in Chapter Four, and you'll find information about Painting Modes later in this chapter and in the ***Reference***. Right now, we'll take just a quick look at where to define ranges.

You can define up to eight color ranges of 32 colors each and assign a cycling speed (RATE) to each range.

▶ Choose **Ranges** from the Color menu. The Range requester replaces the Palette at the bottom of the screen.

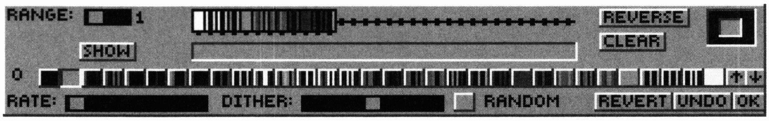


Figure 3.5 Range requester

The Range requester lets you put colors from your palette along a bar to define a range. This flexible way of defining ranges lets you place the colors in different orders from how they appear in the palette. Also, it is now easier to use the same color in more than one range. You'll learn how to use this requester in the next chapter.

Palette and Screen Formats

DeluxePaint contains a universe of 4096 colors. The maximum number of colors available in each format is listed below. The number of colors you can have at any time depends on available memory; if your page is large or you have a large brush, you may not be able to choose the maximum number of colors.

Lo-Res	32 colors in standard LoRes (64 if your computer supports Extra Halfbrite; 4096 in the special HAM mode)
Med-Res	16 colors
Interlace	32 colors in standard LoRes (64 if your computer supports Extra Halfbrite; 4096 in the special HAM mode)
Hi-Res	16 colors

See the ***Reference*** for general information on the various screen formats. ***Appendix D, Amiga Display Modes***, gives a technical explanation of the relationship between screen formats and the number of colors available. See also ***Appendix A, Memory Management***, for more information on memory usage.

Modifying Tools

You've already learned that you can activate any tool by clicking its icon in the Toolbox. A tool remains active until you select another tool or, in some cases, deselect it by clicking the icon a second time. Examples of the latter kind of tool are the Grid and the Symmetry and Magnify tools, which are toggled on and off by each mouse click.

In most cases, right-clicking a tool icon lets you modify some fundamental aspect of that tool. The following summarizes the effects of right-button mouse clicks on the tools in the Toolbox:

Built-in Brushes

You can change the size of any of the built-in brushes in the Toolbox.

- ▶ Right-click the brush.
- ▶ Move the cursor over to the painting area. The word SIZE is attached to the cursor.
- ▶ Hold down either mouse button and drag diagonally to adjust the size of the brush.

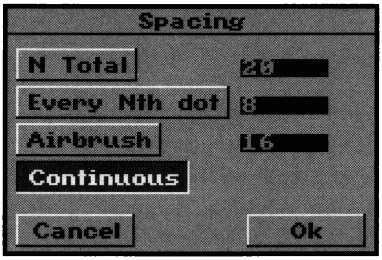
Airbrush

You can adjust the Airbrush's nozzle by right-clicking the Airbrush icon.

- ▶ Right-click the Airbrush icon.
- ▶ Move the cursor over to the painting area. The word SIZE is attached to the cursor.
- ▶ Hold down either mouse button and drag diagonally to adjust the size of the solid circle, which represents the spray area.

Straight Line, Curve, and Unfilled Shape Tools

A right-click on any of these tools brings up the Spacing requester.



N Total 20
Every Nth dot 8
Airbrush 16

Figure 3.6 Spacing requester

The Spacing requester lets you control the distance between "splats" in your lines. This lets you choose whether a line is continuous or dotted. If you want a dotted line, you can define the line in terms of the total number of dots (N Total) or by the number of pixels between dots (Every Nth dot).

Choose Airbrush to use the Airbrush tool with any of the tools that uses the Spacing requester. This is especially useful for smooth airbrushed curves and circles.

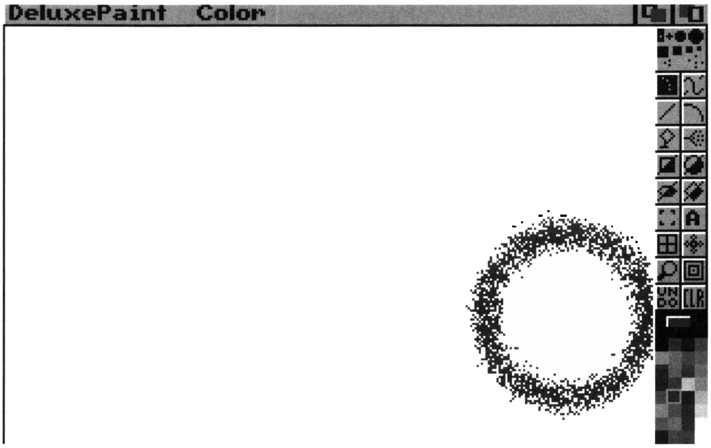

DeluxePaint Color

Figure 3.7 Circle drawn with different settings in the Spacing requester

Right-clicking any of these icons brings up the Fill Type requester.

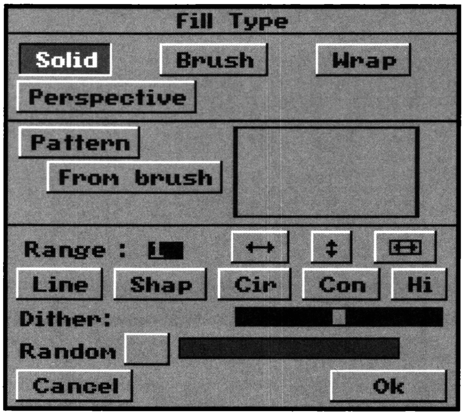

Fill Type
Solid
Brush
Wrap
Perspective
Pattern
From brush
Range :
Line
Shap
Cir
Con
Hi
Dither:
Random
Cancel
Ok

Figure 3.8
Fill Type requester

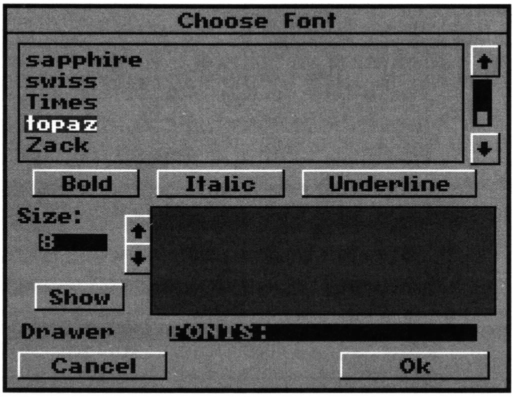
This requester lets you choose one of several fill types for your fills and filled shapes. Many features of the Fill Type Requester are covered in *Tutorials Two: Working with Ranges* and in the ***Reference*** section.

Brush Selector

Right-clicking the Brush Selector restores the last custom brush. Thus, if you had created a custom brush (see ***Custom Brushes*** in this chapter for details) and then made some modifications, right-clicking the Brush Selector would restore you to the previous custom brush. This feature is also useful if you create a custom brush and then select a built-in brush. Right-licking the Brush Selector restores the custom brush.

Text Tool

Right-clicking the Text tool displays the Choose Font requester. You use this requester to choose fonts and styles for the Text tool to use.



Size: 8

Drawer FONTS:

Figure 3. 9 Choose Font requester

- ▶ To select a different type font, size, and/or style, display the Choose Font requester.
- ▶ Click a font from the window. Choose from the available font sizes by clicking on the up and down arrows beside Size:. Click any of the Style buttons (Bold, Italic, Underline), to apply any font style you want. When you have everything you want, click Show to see the font, size and style you have chosen. If you like the results, click Ok.

A special feature of the Choose Font requester is the ability to load fonts from a fonts directory on a different disk. In addition, your Art disk contains two special colored fonts. To use these multi-colored fonts you need to run the ColorText program (double-click the ColorText icon on the DeluxePaint IV Program disk) before you run DeluxePaint IV. Do that now, before loading the fonts from your Art disk. When ColorText is active, do the following:

- ▶ Display the Choose Font requester. Insert the DeluxePaint Art1 disk in any drive. Click in the Drawer edit field, type `art1:karafonts`, and press Return. (If you are using a one drive system, you'll be prompted to swap disks a couple of times. Just follow the prompts).

In a moment, the fonts list from your Art1 disk appears in the Choose Font requester. Let's use one of the fonts.

▶ Click the font named ChiselScript and click Ok. A message asks if you want to use the font's palette. Click Yes. Place your text cursor and type away!

If you want to move your text once it's on the screen, use the Brush Selector to pick it up and move it around. If you are adding text to a picture, there are two good tips you should know: If you fix the background before you type the text, you'll be able to move the text without messing up your picture. Another way to do this is to jump to the Spare page to type your text and then pick it up as a brush to place on your picture.

Grid and Symmetry Tools

Right-clicks on these tool icons let you modify aspects of gridding and symmetry.

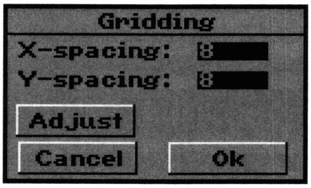
You can also control the spacing between the points.

▶ Click on the Grid icon to turn on the grid

▶ Use the Dotted Freehand tool to paint in the painting area. The dots show you the current position of the grid.

▶ Right-click the Grid icon to bring up the Gridding requester. You can now set the spacing for both the X and the Y coordinates by typing in the actual spacing in the calibration boxes. The spacing is calibrated in pixels.

▶ Click in the X-spacing edit box, delete or backspace to remove the existing value, and then type in the new value — try 20. Do the same with the Y-spacing. Click OK.



X-spacing: 8

Y-spacing: 8

Figure 3.10
Gridding requester

▶ Now try painting with the Dotted Freehand tool to see how the grid has changed.

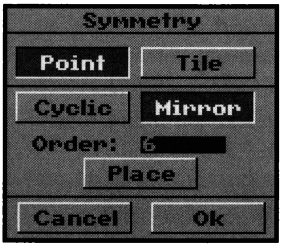
You can also recalibrate the gridding by using a visual method.

- Display the Gridding requester.
- Click Adjust.
- You are returned to the page with a cursor that looks like a matrix. This matrix represents the current grid values in graphic form. To change the values, press and hold down the left mouse button, drag the mouse until the matrix is the desired size and shape, and then release the button.

The new grid is based on this matrix. You can also reposition the points of the grid using Adjust: move the matrix so that its cells are in the desired position and click the left button.

If you are in perspective mode and you right-click the Grid icon, the Perspective requester appears. This requester lets you set a grid for three-dimensional space and also lets you choose other Perspective settings. (See Chapter 5, ***Working with Perspective***, or the description in ***Reference*** of the **Perspective>Settings** option in the Effect menu.)

You can change the settings for the type of symmetry you use by right-clicking the Symmetry tool. This brings up the Symmetry Requester.



Order: 6

Figure 3.11
Symmetry requester

You'll find a brief explanation of each of the options in the Symmetry requester in ***Reference***. For now, if you feel adventurous, try changing the settings and painting with different shapes.

Painting Modes

The options in the Mode menu control the way your brush applies paint to the page. In this section, we'll look at a few of the modes. You'll find information about all modes in ***Reference***.

To look at some of these modes, you'll need paint on the screen, so let's load a picture.

▶ Load the picture Venus from the Art1 disk.

First let's look at a couple of modes that change paint already on the page — these are **Smear**, **Shade**, **Blend**, and **Smooth**.

▶ Select the largest round built-in brush, the Dotted Freehand tool, and Color 0 (black).

▶ Choose **Smear** from the Mode menu, move the brush to Venus' left eye, hold down the left mouse button, and drag back and forth across her eye.

Notice that instead of laying down black paint, your brush smears the paint already on the screen. Smear mixes the existing pixels rather than changing their colors.

▶ Choose **Smooth** from the Mode menu, hold down the left mouse button and drag your brush along the edge of Venus' chin.

Again, the brush uses colors other than black to paint with. **Smooth** reduces the contrast between two adjoining areas by painting intermediate shades along the boundary of the two areas. **Smooth** looks at the current palette and finds the colors closest to the ones under the brush. If the palette contains a wide selection of colors close to the ones under the brush, it will have more colors to choose from. In our case, there are many colors between the dark brown of the chin line and the yellows of Venus' face, so DeluxePaint does a good job of smoothing the edge (see Figure 3.12).

Some of the painting modes change the way the colors of your brush are used. In particular **Matte** and **Color** determine whether a custom brush will paint with the colors in the brush, or the current foreground color. Let's see how that works.

▶ Click CLR to clear the screen.

▶ Choose **Load** from the Brush menu and load the brush named MultiCycleMe from the Brush drawer of your Art1 disk. Choose **Palette>Use Brush Palette** from the Color menu.

❖ When you load a custom brush, your painting mode is automatically changed to **Matte**. Matte paints with the colors in your custom brush.

▶ Drag the custom brush straight down your page to paint a broad stripe of several greenish blues and reds.

▶ Click red in the Color Indicator.

▶ Now choose **Color** from the Mode menu and drag the brush down again.

This time your stripe is all one color (red), because **Color** uses the current foreground color and the shape of your custom brush to paint.

▶ Choose **Cycle** from the Mode menu and drag another stripe.

Now your brush paints a stripe with bands of color running horizontally. Notice that the colors change in the order of the colors in your palette. **Cycle** uses the ranges in the Color Palette requester and cycles the colors as it paints. This is a good example of where ranges affect the way a painting mode works.

▶ Finally, choose **MultiCycle** from the Prefs menu. Select the Straight line tool and drag a line straight down from the top of the page.

MultiCycle tells DeluxePaint to cycle each color in your brush individually when you use the Cycle mode. Since your brush is made up of many colors, they create a many colored pattern. Press the TAB key to see how psychedelic you can paint with colorcycling and MultiCycle.

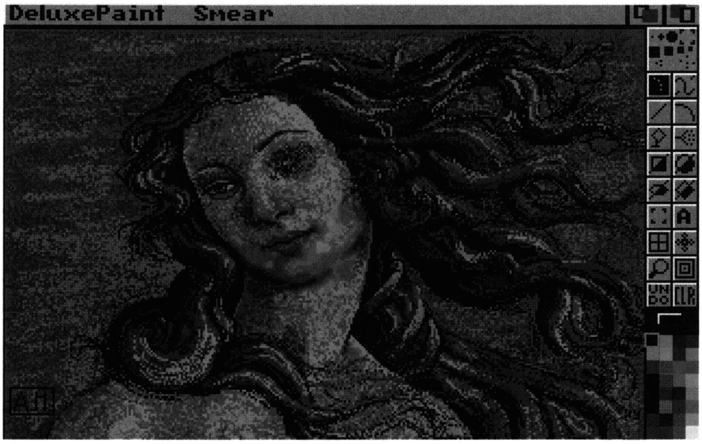


Figure 3.12 VENUS altered with Smear and Smooth brush modes

Extra-Halfbrite Mode

Hbrite mode is a new feature in DeluxePaint. This painting mode is only available if you are using 64 colors. So, let's change our screen format now.

Choose **Screen Format** from the Picture menu. In the requester, click 64 colors and click Ok.

Now your palette should contain 64 colors. The first 32 colors are the same colors you had in Lo-Res format. The second 32 colors are halfbrite equivalents of the first 32.

❖ Not all Amiga 1000's support Extra Halfbrite mode. If the second 32 colors in your palette are the same as the first 32 colors, you do not have an Extra Halfbrite chip. Contact your Amiga dealer for information on how you can upgrade your computer if you want to use this mode.

Let's take a look at how Hbrite paints.

▶ Choose Load from the Picture menu and load the picture named Hall of Stars from the Picture drawer of your Art1 disk. When the requester asks if you want to change the screen format, click NO.

▶ Now select the largest built-in brush and the Dotted Freehand tool. Choose **Hbrite** from the Modes menu. Scrawl anywhere on the picture using the left mouse button.

Notice that when you paint with the left button in Hbrite mode, any colors that are the first 32 in your palette are changed to their halfbrite equivalent. This makes it look as though your picture is getting darker. Hbrite mode is a great way to add shadows to your pictures.

▶ Now scrawl over your picture again, but use the right mouse button.

Any areas of your picture that are already in one of the first 32 colors of your palette are unaffected by your paint, but areas that are painted with any of the 32 halfbrite colors become lighter.

We've demonstrated only a few of the painting modes in this section. Be sure to take the time to review the description of the modes in ***Reference***. Clever use of painting modes can save you time and help you create interesting effects.

▶ Before you move on to the next section, choose Color from the Mode menu. This is the default mode.

Keyboard Equivalents

Most artists have found that DeluxePaint's extensive list of keyboard equivalents helps them work more quickly and efficiently. We are committed to making the keyboard commands an integral and important feature of DeluxePaint. The most important thing to remember about our keyboard equivalents is that you can use most of them *while the mouse button is down*!!! This means that you can use multiple features simultaneously.

A simple example of where using the keyboard equivalents comes in handy is the case of trying to pick up a brush very precisely. Here's what you might do:

Click the Brush Selector. Move the cross hair to the area you want to magnify and press **m** to turn on magnification. Begin surrounding the area you want to pick up and, while the mouse button is down, press **m** again to turn off magnification. Move the cross hair to the other corner of the area you want to select and press **m** again to magnify for precise selection. Finally, release the mouse button and you have your brush.

This is just one example. There are more throughout the program. In particular, when you begin working with animation, you'll find that the keyboard equivalents let you do many things that otherwise would be impossible. If you ever need to use a menu option or other command while the mouse button is down, go ahead and try the keyboard equivalent; it usually works.

You'll find a complete listing of keyboard equivalents at the back of this manual in ***Appendix B***. You'll also find a summary of the keyboard equivalents on the reference card.

Looking Ahead

Before you move on to the next chapter, or off on your own to explore DeluxePaint, we want to introduce you to a few of the interesting and powerful features of the program. You'll find more information about these features throughout the manual.

Fixing the Background

This section shows a very powerful feature that lets you paint on your picture without fear of accidentally messing it up.

▶ Load the picture Seascape from you copy of the Art1 disk. If you are prompted by a screen message asking you if you want to change the screen format or the number of colors, click Yes.

- ▶ Choose **Background>Fix** from the Effect menu.

What you have just done is remarkably simple, and yet remarkably powerful. You have fixed the picture onto the background so that it cannot be removed. Try it.

- ▶ Click CLR and see what happens. That's right — nothing.

The picture is fixed, which means you can draw over it any way you like.

- ▶ Select a thick brush and scrawl on the picture. Do it with the airbrush if you like. Then scrawl using the right mouse button and see what happens.

When you have the background fixed, painting with the right mouse button is truly erasing! Note that you can paint on the picture and then fix the background again to fix the new version. You can erase everything you painted since the last fix with a single click. And you can "unfix" the background as easily as you fixed it: just choose **Background>Free** from the Effect menu. This restores everything back to normal, so that clicking CLR clears the entire picture.

We'll look more closely at this feature in the next chapter when we look at custom brushes and the way they interact with the background. Meanwhile, feel free to experiment further with this feature. Art restorers should have it so easy!

In particular, the combination of right-button brush selection and Fix Background lets you lift any complex shape off a fixed background (provided the shape was applied after the background was fixed), without lifting up any of the background. DeluxePaint preserves in memory all those parts of a fixed background that are covered by unfixed shapes, which means that you can move the shapes around the page and uncover the previously hidden background.

Animpainting

We realize that you may have just started painting on a computer for the first time. But we'll take a daring leap forward to show you animating on a computer. Right now we'll show you a special kind of painting on multiple frames. Just follow the steps carefully, and you'll see some wonderful results.

- Choose **AnimBrush>Load** from the Anim menu. Insert the Art2 disk in any drive and click the Disks button so that <VOL> Art2 appears in the window.
- Click <VOL> Art2. It appears in the Drawer edit box.
- Click <DIR> AnimBrush in the window.
- Double-click the file named "Sweep.anbr".

When the requester closes, you'll have an AnimBrush of a Karate black-belt attached to your cursor. An AnimBrush is special in that it is made up of many cels (short for cellophanes) that flip as you paint.

- Choose **Palette>Use Brush Palette** from the Color menu to see the brush in its own palette.

- Click the brush down once.

- Move the mouse, and click the brush down again.

Notice that now your brush looks different. Each time you click the button the brush moves to the next cel.

- Paint freehand across the screen to see all of the cels of the AnimBrush.

Animation Frames

Above, we had you painting with an AnimBrush on a single screen. Now let's look at what happens if you paint one cel of the brush on each of several screens. This is one way to create animations in DeluxePaint IV.

- Select dark blue as your background color and clear the screen.
- Choose **Frames>Set #** from the Anim menu. (The Set Frame Count requester appears.) Enter 20 in the Count field. (You do this by clicking at the right end of the field, backspacing over the existing number, and typing the new number.) Click OK.

In a flash, you have 20 animation frames to paint on. Notice the numbers 1/ 20 on the left side of the Title Bar. This tells you that you are on frame 1 of 20 frames. Let's paint!

Animating with Animpainting

Animpainting is simply the process of painting at the same time the animation frames flip. In most ways it is like regular painting, since DeluxePaint flips the frames for you.

- ▶ Right-click on the Straight Line tool to display the Spacing Requester. Click the N Total button to highlight it. Click in the edit field next to N Total and set the number to 20. Click Okay to exit the requester with the new settings.

Now your lines will paint exactly 20 stamps of the brush between the start and end points of the line. Using the N Total option of the Spacing requester is an effective way to animate across a simple path, as you'll see in a moment.

- ▶ Press Shift-7 to set your AnimBrush back to its first cel.
- ▶ Select the Straight Line tool. Hold down the Alt key, and drag out a line from left to right across the screen.

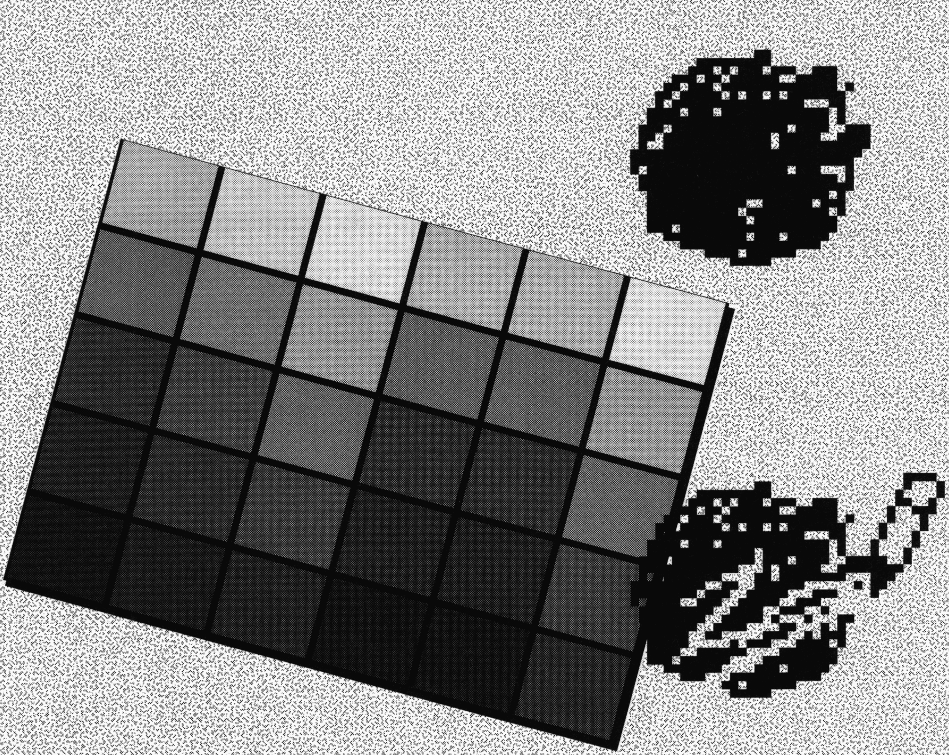
When you let go of your line and the Alt key you'll see DeluxePaint paint your AnimBrush on each frame of your 20 animation frames.

- ▶ When DeluxePaint is finished painting, press `5` on the keyboard.

The Karate expert shows all of his best moves. Press `4` if you want to see your animation play continuously. If the animation moved too quickly, press the left arrow key repeatedly to slow down the play rate. Press the *space bar* to stop the animation.

Summary

This chapter completes the ***Guided Tour*** of DeluxePaint IV. Chapter 4 presents some painting tutorials, which will help you learn how to get the most out of the way the program uses colors and palettes. Because DeluxePaint's color capacity is one of the program's strongest and most versatile features, we highly recommend that you work through the exercises we have described there.



Painting Tutorials

4

Chapter 4: Painting Tutorials

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The four tutorials in this chapter introduce some of the most powerful painting features of DeluxePaint IV. Though the tutorials have a common theme — effectively using the program's colors — each tutorial is independent from the others, so you can choose to complete only the exercises that interest you.

Tutorial One: Working with Colors

This tutorial will walk you through how to use the DeluxePaint IV color requesters.

▶ Start DeluxePaint IV fresh, and at the Screen Format requester, choose Lo-Res 16 colors.

Sixteen colors is far from the maximum number of colors you can work with, but it is a good place for us to begin explaining the color manipulation features of DeluxePaint IV. If you're familiar with DeluxePaint III, you will see that the program has changed a bit to bring you more powerful color tools for working in HAM mode. These tools can also be useful in other modes, as you'll soon see.

Manipulating the Palette

In this section of the tutorial, we'll look at the ways you can manipulate your palette. This will help you make best use of the colors available to you in non-HAM modes.

The Toolbox Palette (What You Can Paint with)

You may remember from the Guided Tour that the number of colors you can paint with depends on the Screen Format you choose to work in. The important thing to remember in all modes except HAM is that all of the colors you can paint with appear in the palette area below the toolbox. If you are ever confused about which colors are available to you, look at the Palette below the Toolbox to see your colors.

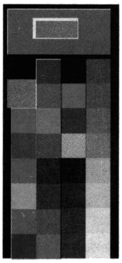


Figure 4.1
Color Indicator and Palette

Of course, you can change these colors to create the ones best suited to the artwork you have in mind. The common way to change colors is to use the Palette Mixer.

The Palette Mixer

- ▶ Move the cursor over the Color Indicator and click with the right mouse button.

Right-clicking on the Color Indicator displays the Palette Mixer. You can also display this requester by choosing **Palette>Mixer** from the Color menu, or by pressing **p** on your keyboard. Use the method that is most natural for you.

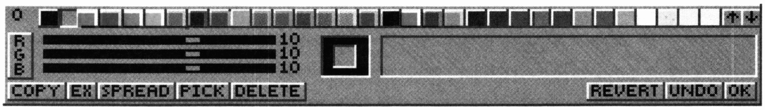

0
R
G
B
10
10
10
COPY
EX
SPREAD
PICK
DELETE
REVERT
UNDO
OK

Figure 4.2 The Palette Mixer

Palettes vs. Color Sets

One of the first things you'll notice about the Palette Mixer is that it contains more slots than there are colors in your Palette. In DeluxePaint IV you are able to mix and spread colors outside your palette as a way to "experiment" with colors before committing to them in the picture.

There are 32 color slots to a row, and 8 rows numbered 0 through 7 for 256 color slots in the Mixer. We call this collection of slots the Color Set. The Palette is a smaller number of colors included in the Color Set. In the Palette Mixer, the Palette colors are arranged in row 0, and the top and left edge of each color is outlined in white. The top and left edge of non-palette colors is outlined in light blue. When you are in a 16-color mode or HAM, you can use the left edge of the Mixing Area as an additional guide to where the first 16 palette colors end.

When you first open the Palette Mixer, you have only palette colors and the rest of the slots are empty. Empty slots are indicated with a checked pattern. If you try to paint with one of these color slots, you'll see that the color is white by default.

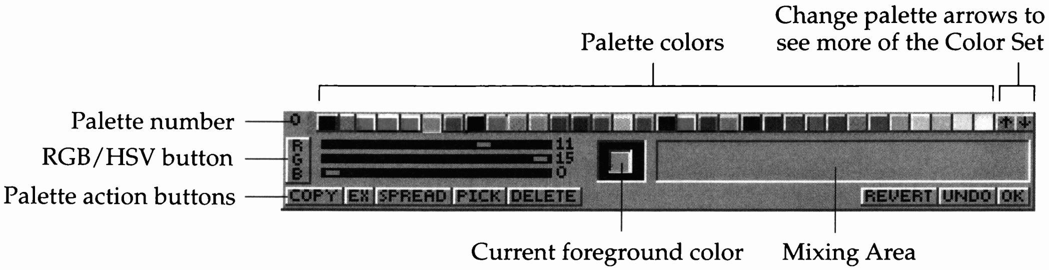

Change palette arrows to see more of the Color Set
Palette colors
Palette number
RGB/HSV button
Palette action buttons
0
R
G
B
11
15
0
COPY
EX
SPREAD
PICK
DELETE
REVERT
UNDO
OK
Current foreground color
Mixing Area

Figure 4.3 The Palette Mixer

RBG/HSV Sliders

First let's look at how you can change the colors that already exist in your palette.

▶ Click on the bright red in the Palette Mixer and paint on the screen.

As you can see, you can still paint on your image when the Palette Mixer is displayed.

▶ Now, drag the sliders in the Palette Mixer to alter the red.

Notice that the color on the screen changes as you change the color in your palette. The red in the Color Mixer is a Palette color, so the color you placed on the screen is tied directly to the color in the Palette. This is true of most Screen Format settings in DeluxePaint IV. HAM is the exception. In HAM it is possible to paint on the screen with colors that are not in your palette. We'll explore these two color models in a moment in Introduction to RGB and HSV Color Models.

▶ Click on the RGB button to change to HSV. Now use the HSV sliders to alter the color some more.

DeluxePaint IV lets you set your color values using either the RGB (red, green, blue) or HSV (hue, saturation, value) models. You'll learn more about both of these color models in a moment.

UNDO

▶ Click UNDO in the Mixer to undo the change to the palette. You'll see both the color in your palette and the color on the screen restored to red.

You can undo any change to a color in your palette so long as you don't click any other color before you click UNDO. Undo remembers and reverses only the most recent change. If you wanted to return to the palette and color set you had when you first opened the Palette Mixer, you would click REVERT. The UNDO button makes it possible to experiment with colors in your picture and return to the original easily if you don't like your experiment.

Copy and Exchange

You can rearrange the colors in your palette by using the COPY and EX(change) buttons.

- ▶ With the red color selected, click COPY and click on the first empty slot to the right of your palette to copy the red there.
- ▶ Click the Yellow in your palette and copy it to the empty slot beside the new red.
- ▶ With the new yellow color selected, click EX and click on the new red to swap the positions of these colors.

Copy and Exchange are straightforward ways to arrange colors in your palette. Perhaps the most important way you'll use them is to arrange your palette for creating spreads between colors.

Spreading Colors

Spreading colors is an effective way to get subtle shades of a color. Let's create a spread of colors from white to dark blue.

- ▶ Click on the white in your palette colors. Click SPREAD and click on the dark blue at the right end of your palette colors.

Now you have a spread of colors from white to blue with the color settings for each of the slots mathematically calculated to give you the most evenly spread colors based on the number of slots between the white and the blue. Note that DeluxePaint uses the HSV model to build its spreads. This means that when you spread between blue and yellow, the colors in between will run through the greens in the color wheel.

Many other functions in the program (including Ranges) use the RGB model to calculate spreads of color. It is important to understand the distinction between these two color models and how to use them to your advantage. If you aren't already familiar with these two color models, be sure to work through the section ***Introduction to the RGB and HSV Color Models*** below for an explanation of basic color theory.

Color Set

Now that there are no reds or yellows in your palette (though there is one of each in your Color Set), we want to illustrate an important concept.

SPECIAL NOTE *In any color mode other than HAM, if you try to paint with a color from the Color Set that is not in your palette, DeluxePaint paints with the color in your palette that most closely matches the Color Set color.*

Here's an example:

- ▶ Click on the red in your color set and paint with it on the screen.

You should see that you are painting with the darker of the two grays in your palette, because this gray is the color in your palette that is closest to red in the RGB color cube. (You'll learn more about the RGB color cube later in this section.)

▶ Click on the yellow in your color set and paint with it on the screen.

You should see that you are painting with the lighter of the two grays in your palette. As we mentioned above, the best way to know which colors you can actually paint with when you are in any screen format other than HAM is to look at the palette underneath the Toolbox.

The Mixing Area

The mixing area lets you mix colors together the way an artist mixes paint. Like the extra color slots in the Color Set, the Mixing Area can contain any of the possible 4096 colors, but unless you are using HAM mode, you will be able to paint only with the colors you place in your palette. Let's mix a new color right now.

▶ Choose the third round built-in brush from the toolbox. Choose the red color from your Color Set and paint with it in the Mixing Area. Then choose the yellow and paint into the red.

You'll see the two colors mix together to form oranges. As you mix, your brush spreads the mixed colors, but each time you click down, your brush starts over with yellow automatically so you can gradually add the yellow to the red.

To move your new color into the Color Set you use the PICK button.

▶ Click on an empty slot in the Color Set. Click PICK. (Your pointer changes to an eyedropper.) Click on a color in the Mixing Area.

The color you clicked on is added to the Color Set in the slot you chose.

To clear the Mixing area to any color and start over, you copy a color to the color mixer.

▶ Click on white in the Mixing Palette. Click the COPY button. Click in the Mixing Area to clear it to white.

Arrange Palette Requester

Although we moved a few colors in the palette using the Palette Mixer, the best place to accomplish this sort of operation is in the Arrange Palette requester.

▶ Choose **Palette>Arrange** from the Color menu.

This requester lets you see four rows of colors at a time, and you can quickly scroll through the other four rows with the up and down arrows. Each click on the arrows to the right of the color rows moves the rows up or down by one. The number in the upper left corner of the requester is showing you the number of the row at the top of the list. When you are looking at the first four rows (rows 0 - 3), this number is 0, when you're looking at the last four rows (rows 4 - 7), the number is 4. If you hold down the **Shift** key when you click on the arrows, you move directly to the first or last four rows.

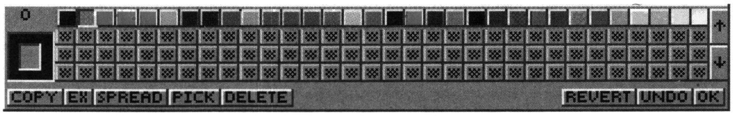


Figure 4.4 Arrange Palette requester

The buttons in this requester work just like the ones in the Palette Mixer. The SPREAD option is especially useful in the Arrange Palette requester because it lets you easily spread over multiple rows in the set without having to scroll the rows.

Loading and Saving Palettes and Color Sets

DeluxePaint IV also lets you load and save Palettes and Color Sets. If you continue on to the Ranges tutorial, you'll see an example of loading a Color Set. Otherwise we recommend that you look in the Reference for information on how to use these features.

Introduction to the RGB and HSV Color Models

In this exercise, you'll be looking at the Reference Palette to learn how DeluxePaint mixes red, green, and blue to form other colors. You'll also see the relationship between the RGB and HSV (hue, saturation, value) color systems.

▶ Choose **Load** from the Picture menu and load the picture named Reference Palette from the Picture drawer of your Art1 disk.

❖ If you see the message asking if you want to change screen format to that of the file, click Yes.

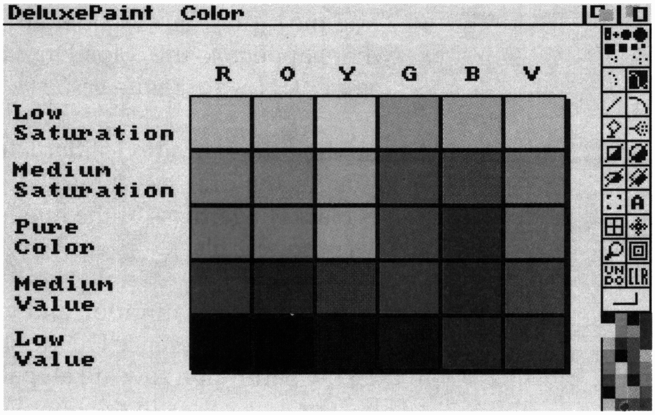


Figure 4.5 The Reference Palette picture

The Reference Palette picture shows you a matrix of the colors in the color spectrum: Red, Orange, Yellow, Green, Blue, and Violet. These are the colors that are produced when you mix colored pigment. In effect, these are the colors a traditional painter would work with. This is not the spectrum produced when you mix colored light. That spectrum produces the colors Red, Yellow, Green, Cyan, Blue, and Magenta.

▶ Choose **Palette>Mixer On/Off** to display the Palette Mixer. Click on the main screen to activate it. Press F10 to hide the Menu Bar and Toolbox. Place your cursor over the picture and press the down-arrow key on the keyboard until the ROYGBV letters in the picture are at the top edge of the screen.

Now let's look at the RGB and HSV values of some of the colors in the Reference Palette.

▶ Click PICK in the Palette Mixer and then click the red square in the row labeled Pure Color. Look at the sliders in the Mixer.

In RGB terms, your Mixer shows that a pure red is all red color with no green or blue.

▶ Click the RGB button to change to the HSV sliders.

In HSV terms, pure red is hue 0 with full saturation and full value. Saturation is the relative amount of color to white, and value is the relative lightness or darkness of a color. Value is often referred to as Luminosity. To see exactly what this means, let's change the sliders a bit.

- Drag the saturation (S) slider all the way to the left to see what happens to the color. Drag the saturation slider back to the right. Now drag the value (V) slider all the way to the left.

As you drag the saturation slider left, the red gets lighter until it is white. As you drag the value slider left, the red gets darker until it is black. Regardless of the hue or saturation, a value of zero always produces black.

The meaning of the saturation and value sliders is exactly what the matrix in the Reference Palette shows. Notice that the colors in the Low Saturation row are all pale — they don't contain much color. The colors in the Low Value row are dark — they don't contain much luminosity. The colors in the Pure Color row contain full saturation and full value.

Hue simply refers to the position of a color on the color spectrum or rainbow — Red, Yellow, Green, Cyan, Blue, or Magenta, and the various shades in between. Figure 4.6 shows the positions of colors on the Color Wheel.

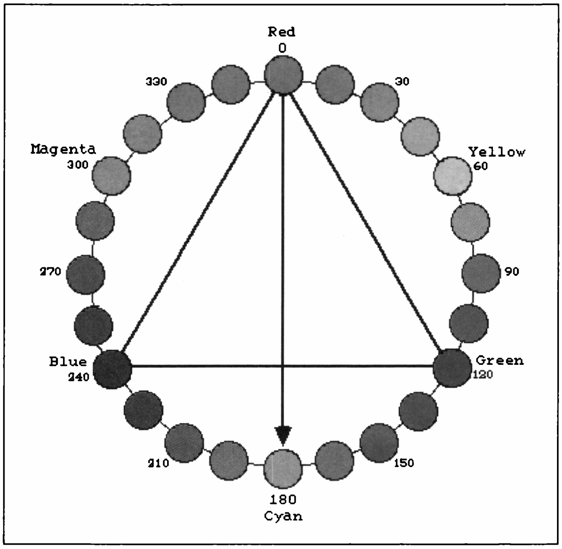


Figure 4.6
The Color Wheel

Let's look at another color in the Reference Palette.

- Click PICK and then click on the yellow square in the Pure Color row.
- Click the HSV button to switch back to RGB sliders.

The RGB sliders show that yellow contains the maximum amount of red and green, but no blue. Yellow is said to be the "complement" of blue. Each of the primary colors has a complement. In the RGB color system, the relationship of the primary colors and their complements are best thought of as a cube in which each dimension is measured in one of the three primary colors, as shown in Figure 4.7. The complement of each primary color is positioned at the opposite corner of the cube. Thus, moving downward on the edge of the cube to add red to green produces yellow (R15, G15, B0) the complement of blue, which is positioned at the opposite corner from blue. If you look back at Figure 4.6 you'll see that in the HSV color system, the complements are also directly across the circle from the primary color — yellow is directly across the wheel from blue.

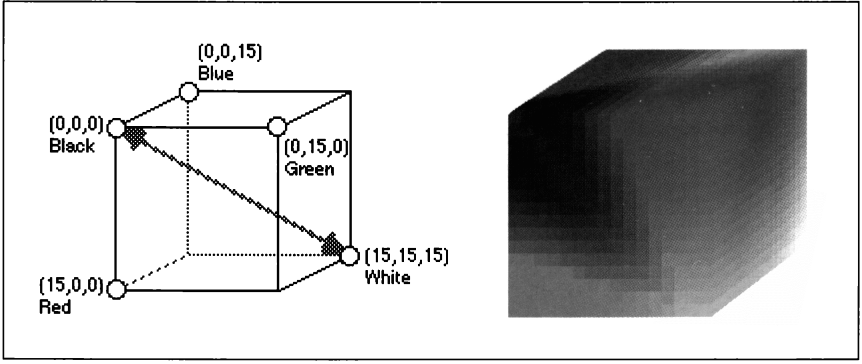


Figure 4.7 RGB color cube

Notice that black is the absence of color (R0, G0, B0) and white is the maximum level of the three colors (R15, G15, B15). The line running diagonally through the center of the cube from black to white shows the positions of the grays, which are formed by combining equal amounts of red, green, and blue. Thus R8, G8, B8 would yield a medium gray. Let's try this in practice:

- ▶ In the Mixer, drag each of the RGB sliders to 8. Once all three primary colors are at 8, you have medium gray.
- ▶ Click the RGB button to see the HSV slider. Look at the position of the value slider in your Color Palette; it is at the same level as the red, green, and blue sliders. (You can click quickly back and forth between the two slider systems to confirm this.)

The mixing of grays is one area where the HSV system excels. Rather than moving all of the RGB sliders to the same position, you can simply drag the saturation slider all the way to the left and move the value slider to the level of gray you want. The position of the hue slider will have no effect, because there is no color (no saturation) in gray.

- ▶ Move the hue slider left and right and notice how the gray you produced doesn't change. Now move the value slider left and right and switch back and forth between the two color systems to see how the RGB sliders move along with the value slider, always staying in a perfect line.

Can you change the color back to yellow? Remember, yellow is the complement of blue.

- ▶ Move the red (R) and green (G) sliders all the way to the right and move the blue(B) slider all the way to the left.

Now that you know the basics, try mixing a few colors you like using either one of the two color mixing systems. Here's a trick you might also consider: mix a few palettes that you particularly like and save them using the **Palette>Save** option in the Color menu. You can then automatically produce that palette by loading it from the Color menu.

Before we leave the topic of color mixing, let us just summarize a few important points:

- ☐ Your Amiga and DeluxePaint mix colors using the RGB system, and this system is represented by the color cube.
- ☐ If you want to find any pure color, you can do so using the HSV system by moving the saturation and value sliders to the right and then scrolling the hue slider until you find the color you want.
- ☐ If you need to produce a gray, you can do so by setting all three of the RGB colors to the same level, or by setting the saturation slider to the left and adjusting the value slider to the gray level you want.

Besides providing a sample spectrum for our color mixing tutorial, the Reference Palette is useful for adjusting your monitor. Reload the picture to restore it to its original colors and print out a copy on your color printer. Then adjust your monitor until the colors on your screen look the same as those on the paper.

Tutorial Two: Working with Ranges

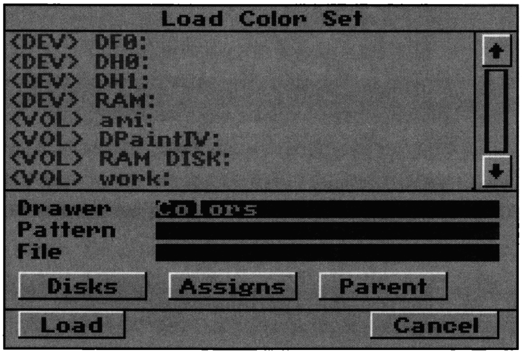
In this section you'll learn how to build a Range for use in gradient fills and color cycling. DeluxePaint IV has moved the range functions out of the Palette Mixer requester to make ranges more versatile in all color settings. First we'll show you how to work with ranges in 32 color mode, since this mode illustrates the basic concepts you need to master. The tutorial Painting in HAM will explain how Ranges work in HAM. So, before you begin:

Loading a Color Set

- ▶ Change your Screen Format to Lo-Res 320 x 200 with 32 colors.

Before you begin building a range, we'll have you load a Color Set that contains a pleasant spread of colors to paint the range with.

- ▶ Choose **Color Set>Load** from the Color menu.



Drawer Colors
Pattern
File

Figure 4.8 Load Color Set requester

- ▶ When the first Load Color Set requester appears, insert you Art1 disk in the drive and load file Range.set from the Colors drawer.

Once the Color Set is loaded, you are presented with a second Load Color Set requester that is similar to the Arrange Palette requester.

This requester allows you to choose which colors you want to load from the color set to add to your current color set. And you can choose to add colors to your current set, or you can overwrite the colors in your color set with the new colors. We want to load all of the colors from this new color set and overwrite the colors that are in our current color set. To do this:

- ▶ Click the Overwrite button.

The Overwrite button loads colors into your current color set starting at color 0. After the Color Set is loaded, the Arrange Palette requester is automatically displayed so that you can arrange the colors as you like. The Palette you'll see contains two spreads of color that paint smooth gradients even in the Low Resolution mode we are using now. These spreads of color were created by mixing the color at each end of the spreads in the Palette Mixer and then using the SPREAD option to generate the colors between.

Building the Range

▶ Choose **Ranges** from the Color menu to display the Range requester.

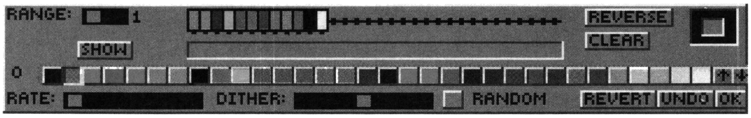


Figure 4.9 Range Requester

The Range Requester is DeluxePaint's new way of building ranges for use in painting gradients or cycling colors. You can build up to eight ranges for each document, and these ranges are saved with the file. When you start the program, it contains a default set of colors in the first range. In our case, the default range contains the grays in the lower half of the palette. We'll leave this range in place and build a new one. The slider in the upper left corner of the requester lets you choose the current range being used by the program.

▶ Click to the right of the slider to move to range 2.

Range 2 should still be empty and ready for us to work with. To build a range, you place colors on the bar just as you saw them in the first range. If Range 2 is not empty, click the CLEAR button.

▶ Click on the last yellow in the requester.

Your cursor becomes a rectangular bead, and the color indicator in the upper right corner of the requester shows that you are holding a yellow color.

▶ Move the cursor to the first mark on the range bar and click. (Your yellow color appears on the bar and your cursor reverts to an arrow.) Place the second yellow on the bar the same way.

TIP You can speed up the process of placing colors on the bar by using the bracket keys [ ] to change the color of your color bead. We'll do it now:

▶ Press the left bracket key [to move to the next color in your palette.

Your arrow cursor becomes a bead again and is holding the new color.

▶ Click the bead in place on the range bar. Repeat pressing the bracket key and clicking on the bar until you have all of the yellow through orange and red spread on the bar.

- ❖ You don't need to put the colors right next to each other on the bar to build an effective range. And you don't need to put the colors in the same order that they appear in the palette. We're doing this only because this is the most convenient way to work with ranges in modes other than HAM. We'll show you some other variations on ranges when we look at gradients in HAM and at Color Cycling later in this tutorial.

- ▶ Click the SHOW button to see the range painted as a gradient.

You'll see a gradient painted with your current range in both the requester and in a bar above the requester. The gradient inside the requester shows you the gradient using all of the colors available for that gradient in the Amiga color universe of 4096 colors. If you are not working in HAM mode (and we're not) the second gradient appears above the requester to show you how the gradient will look using your current palette. Since our range was built from colors that exist in the palette, and we placed all of the colors on the range bar, our gradient looks spectacular.

The Reverse Button

The REVERSE button beside your new gradient does exactly what its name implies, it reverses positions of your colors on the range bar.

- ▶ Click REVERSE once to see how it reverses the colors on the range bar and repaints the gradients. Click the button a second time to return the range to its original order.

Pattern and Random Dither

At the moment, the gradients you see for your range are painted using a regular pattern that produces an even transition between colors. If you want to exercise a little more control over your gradients or if you want to eliminate the smooth transitions altogether, you can do this with the Random button and Dither slider at the bottom of the Range requester. When you click the Random button, your gradients are painted using a Random dither that you control with the dither slider.

- ▶ Click the Random button at the bottom of the requester.

A check mark appears in the middle of the Random button when it is selected. Notice that now your gradients are redrawn using a random dither.

- ▶ Drag the Dither slider all the way to the right to see how this affects your gradients. Drag the slider all the way to the left to see the gradient with no dither.

- ▶ Click the Random button again to turn off random dither.

Now that you've seen how most of the Range controls work, let's move on to painting with this range to see how it is used in gradient fills.

Gradient Fills

As we mentioned above, one of the areas of DeluxePaint IV where ranges are used is in the painting of gradient fills. There are two general types of gradient fills to know about in DeluxePaint IV. The first type of gradient is the linear style that was supported by DeluxePaint III. The second is a "directional" gradient that lets you specify the angle of any linear gradient, and the central point for any radial style gradient. We'll show you how to draw one of each of these gradients.

The Fill Type Requester

As mentioned in the Guided Tour, the Fill Type requester is where you choose what type of fill your filled shapes and the Fill tool will use. You display this requester by right-clicking on the Fill tool or any filled shape tool.

- ▶ Right-click on the Fill tool in the Toolbox to display the Fill Type requester.

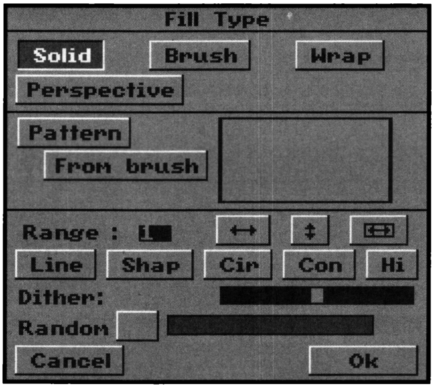


Figure 4.10 Fill Type requester

The lower section of the Fill Type requester contains an assortment of options for filling with a range. You can choose which of your Ranges you want to fill with, and how the program should perform the fill. The requester also shows you a representation of your current range and lets you set the Random and Dither options just as you would in the Range requester.

Linear Fills ↔ ↕ ▭

The first three icons in the gradient area of the Fill requester are fills that were supported in DeluxePaint III. Let's paint with the first of these options to see what they are like.

- ▶ Click the ↔ icon in the requester.
- ▶ If you aren't already looking at Range 2 (yellow to red) in the requester, click in the Range box, delete the current number, type 2 and press Return to change to range 2. You'll see the range painted in the requester. Click OK.
- ▶ Select the Filled Circle tool and draw a circle that is about two inches wide.

In a moment DeluxePaint paints a circle that is filled horizontally with your gradient from left to right. The other two options in this row work essentially the same way. They paint linear fills either horizontally or vertically. Try them out for yourself, or see Figure 4.13 for an illustration of these gradients.

Directional Gradients

DeluxePaint IV introduces new gradients that allow you to define the direction of the gradient at any angle. There are two styles of gradients: linear gradients and radial gradients.

Linear Gradients

The two linear gradients are LINE and SHAP(E). When you fill with these gradients, you use a "directional" line to indicate the angle of your gradient.

- ▶ Select the Filled Circle tool, and press `Shift-F` to display the Fill Type Requester. Select the LINE option and click OK.
- ▶ Draw another filled circle that is about two inches wide.

When you release the mouse button, your cursor changes to a cross-hair with a line connecting it to the center of the circle. We call this the "directional" line, and you use it to define the direction of your gradient. Let's paint this linear gradient at an angle.

- ▶ Position the the cross-hair so that your line extends up and to the right at an angle of about 45 degrees (as in Figure 4.11) and click.

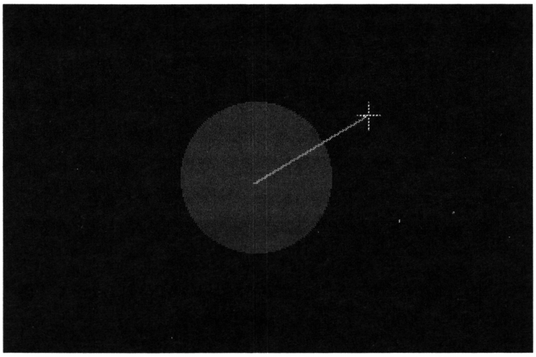


Figure 4.11 Positioning the directional line

This new circle is painted with a gradient at 45 degrees.

Radial Gradients

The three radial gradients are CIR(CULAR), CON(TOURS), and HI(GHLIGHT). When you fill with these gradients, you use the directional line and cross-hair to indicate the point from which the gradient will radiate.

- ▶ Display the Fill Type requester. Select the CIR option and click OK. Draw another filled circle that is about two inches wide.
- ▶ When the directional line appears, place the line at a 45 degree angle, but this time make sure the cross-hair is mid-way between the center of the circle and its edge as in Figure 4.12. Click the mouse button.

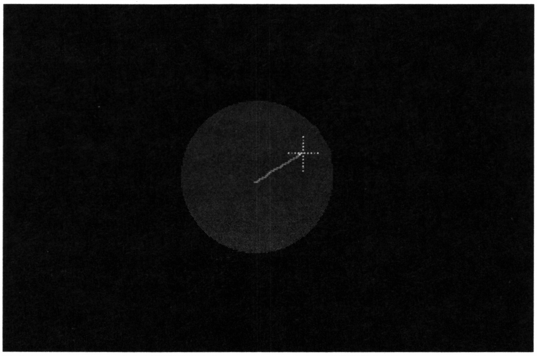


Figure 4.12 Positioning the directional line for a radial fill

This time your circle is filled with a gradient that radiates outward from the point where you clicked. The gradient is painted with the first color of your range as the highlight color where you click. If you clicked outside the circle, the gradient would still use the point where you clicked as the point from which the gradient would radiate, and the effect would be different. Give it a try if you like.

The figure below shows an example of each of the gradient fills available in DeluxePaint IV drawn using the yellow to red gradient. If you like, experiment with the other gradient fill types and play around with the Random dither setting too. We also recommend that you try the radial gradients with different shapes to get a feel for which combination of fill and shape gives the best results. Of course "best" is entirely a matter of personal taste.

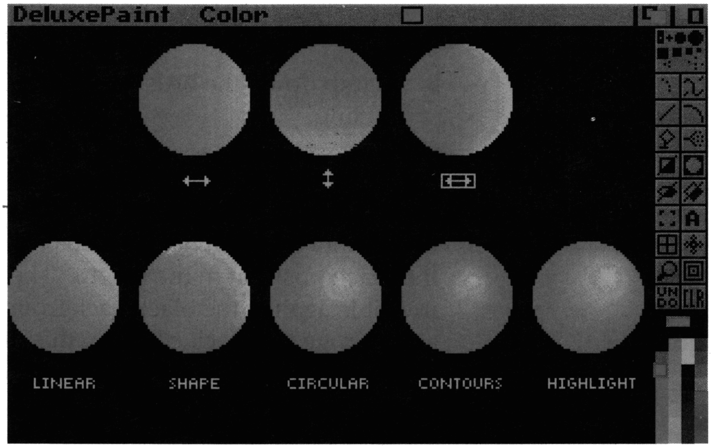


Figure 4.13 Example of the eight gradient fill types

Color Cycling Ranges

In the Gradient Fills section you learned how to use a range to fill shapes with a gradient. You can also use these same ranges and others to create color cycling animations. If you are familiar with DeluxePaint III, you probably already know about the simplest form of color cycling. This type uses ranges of consecutive colors just like the one we built for painting the gradients in the example above. DeluxePaint IV introduces two other types of color cycling that allow you to use colors that are not in your palette in a color cycling range. We'll walk you very quickly through each of the different versions of color cycling, and then have you look at some color cycling brushes that are included on your Art1 disk.

Conventional Color Palette Cycling

The simplest form of color cycling makes each of the colors in the cycling range move over to use the color in the next slot in the range. This type of color cycling requires that you use multiple colors from your palette to perform the color cycle. By cleverly combining colors, you can simulate animation with this kind of color cycling. There are several examples of this type of color cycling on your Art1 disk. Let's take a look at two of them now:

The Running Man

- ▶ Choose **Load** from the Brush menu and load the Cycle2 brush from the Brush drawer on the Art1 disk.

Your Brush is now several images of a running stick figure.

- ▶ Choose **Palette>Use Brush Palette** from the Color menu to change your palette to the palette of the brush.
- ▶ Make Color 0 your background color and click CLR to clear your screen to black.
- ▶ Stamp down the brush and press the **Tab** key to start color cycling.

Each position of the running man was drawn in a different color from Range 1. Because five of the six colors in this range are black, only one frame shows at a time, as the white color cycles into each position in the palette. The remaining five images are invisible against the black background. (Display the Color Mixer and change the black colors in this range to any non-black color to see all the frames.)

The Spinning Wheel

- ▶ Load the brush Cycle1 from your Art1 disk; stamp down the brush and press Tab to turn on color cycling.

This color wheel was drawn as a circle with lines radiating out from the center. The pie-shaped pieces were then filled with adjoining colors in Range 2 of the Range requester. Thus, as the colors in the wheel cycle, the wheel appears to spin.

The brushes Birds, Snowball, StormNight, and Fireworks are other examples of this kind of color cycling animation. Load each of them, change to the brush palette and turn on color cycling to see how they work.

Single Color Register Cycling

DeluxePaint IV also allows you to cycle a single register through a range of colors. Rather than have you load an example to see this effect, we'll have you build one from scratch.

- ▶ Choose **Palette>Default Palette** from the Color menu.
- ▶ Display the Ranges requester and move the slider to range 2. Click the Clear button beside the range to clear it.

- ▶ Click on the third color in the palette (bright red) and place it on the left side of the Range bar. Place the bright yellow in the middle of the range bar. Click the Show button to show your new range.

Now you have a gradient that runs from red to yellow in the requester. (The gradient above the requester looks a bit less impressive because you don't have all of the in-between colors in your palette to make a smooth gradient.) At the moment, your range uses two color "registers," that is colors from your palette to build the range. You can tell that the colors on the Range Bar are colors from your palette because each of the color beads has a little dot beneath it. This little dot indicates that the colors are from the palette. The secret now is to change the yellow to a non-palette color. We do that by "picking" the RGB value we want from the gradient in the requester.

- ▶ Press the comma (,) key on the keyboard to get the eye-dropper cursor. Move the cursor to the bright yellow area of the gradient in the requester and click to pick that bright yellow color.

A new bead is now your cursor and the color indicator in the requester shows that the color is bright yellow.

- ▶ Click this new color bead directly over the yellow bead in your range.

Notice that the new yellow bead on the Range Bar does not have a dot beneath it. This indicates that the color is not from the palette, but instead is an RGB value that the program will use for gradients and color cycling.

- ▶ Press the comma key again, pick a bright red from the left side of the gradient and place it on the far right end of the Range Bar.

Your Range Bar and gradient should now look like the one shown in Figure 4.14.

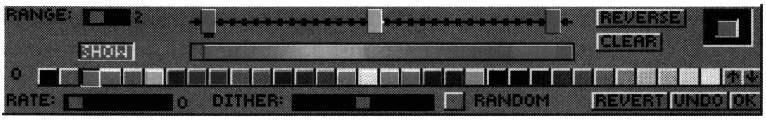


Figure 4.14 Range Bar with red and yellow range using non-palette colors

- ▶ Move the Rate slider in the requester three fourths of the way to the right and click OK to close the requester.
- ▶ Choose the bright red in the palette and paint with it. Then press Tab to start the colors cycling.

You should now see your bright red color cycle through orange and yellow and back to red repeatedly. Notice that the red color in your palette also cycles through orange and yellow, but that no other colors in the palette change. You are cycling the color on your screen but using only a single color register!

As you might well imagine, this new form of color cycling is very useful for strobing effects of causing an area of your picture to fade in and out without giving up a lot of colors to do it.

Hybrid Cycles

You can combine the conventional color cycling with RGB colors in the range to create moving images that also strobe. We've included a couple of these on the disk to give you the idea. Take a look at them now if you think that you'll be using color cycling in your pictures. These cycles are of special interest.

- ▶ Choose **Load** from the Brush menu and load the CycleCircle brush from the Brush drawer.
- ▶ Choose **Palette>Use Brush Palette** from the Color menu to change your palette to the palette of the brush.

Your Brush is now a blue and white circle.

- ▶ Stamp down the brush and press the Tab key to start color cycling.

Notice that although the original brush did not contain any yellows in it, as the wheel turns, yellow and gold colors strobe into the cycle. If you display the Range requester and examine Range 1, you'll see a combination of palette colors (color beads with the dot beneath) and RGB colors (without the dot). The brushes Fountain and Lighthouse also use this range and demonstrate practical uses for this type of color cycling.

TIP If you want to create your own cycling pictures that use this hybrid style of color cycling, create a conventional cycle range first and paint the picture so that it animates correctly when you cycle. Then add the RGB colors to the cycle range to incorporate the strobing effect.

Tutorial Three: Painting in HAM

Through the wonders of HAM mode, the Amiga computer lets you paint with 4096 colors simultaneously. In the right hands, this mode can yield wonderful results. If you are not already familiar with painting in HAM from some other product, it will likely take you some time to get used to this mode. This section will walk you through a tour of HAM as it is implemented in DeluxePaint IV. If you plan to work in HAM at all, we strongly recommend that you work through this section.

Before You Begin

- ▶ Start the program fresh and at the Screen Format requester, choose Lo-Res 320 x 200 and HAM.

The HAM Palette

The first thing you'll notice when you start the program in HAM mode is that the Toolbox Palette now has arrows and a letter in the space below it.

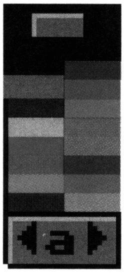


Figure 4.15
The Color Indicator and HAM palette

The arrows let you scroll through the colors in your Color Set, and the letter tells you which of the groups of 16 colors you are currently looking at.

- ▶ Click the right arrow below the palette several times to scroll forward through the Color Set (most of the colors are blank). Click the left arrow to scroll backward through the Color Set.

You can move quickly to the beginning or end of the Palette by holding down the Shift key when you click the arrows.

- ▶ Hold down the Shift key and click the right arrow to move to the last group of colors. Shift-click the left arrow to to move to the first group of colors.

The first group of colors in the Color Set (the "a" group) contains your actual Palette colors. The other colors are simply part of the Color Set, but unlike in other modes, you can actually paint with these extra colors.

So what's the difference between a Palette color and a Color Set color in HAM? We're glad you asked...

HAM Ramping

When you paint in HAM, any colors that are not in your Palette (group "a" of the colors below the Toolbox), are displayed on the screen by copying the color in the pixel to the left and modifying one of the RGB components of the color. (You'll find a technical explanation of how this is accomplished in ***Appendix D.***) Because HAM mode can change only one of the color components at a time, it can take up to three pixels to reach the color you really want to paint with. This transition from one color to the next is called a "ramp." Let's take a look at an example.

- Choose the largest square built-in brush and the Freehand tool.
- Press `p` to display the Color Mixer.
- In the Mixer, Copy color 0 (black) to color 15 (magenta). Now Click SPREAD and spread between the two blacks. This will change all of your palette colors black.
- Click on one of the empty color slots in the row (remember: the default color of these slots is white), paint a square on the screen and press `m` to magnify it.

You should see that your white square has a ramp on the left side. From black the color changes to green, then to yellow, and finally to white. The ramp required three pixels to reach white because the change from black to white requires a modification to each of the R, G, and B components of the color, and there are no intermediate colors.

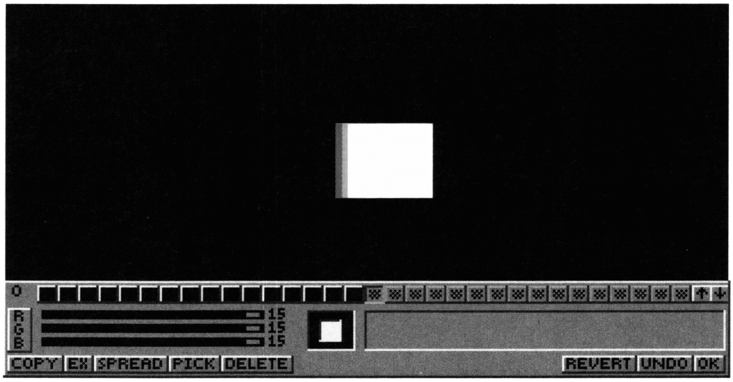


Figure 4.16 HAM Color Ramp from black to white without intermediary colors

If there were an intermediary color in the palette, the ramp might be accomplished in more or less than three pixels and result in a smoother transition from black to white. Let's look at an example:

- ▶ Choose **Palette>Default Palette** from the Color menu.

Now you are back to the standard HAM palette. This palette contains some intermediate grays and an assortment of colors spaced throughout the color cube.

- ▶ Click on one of the empty color slots to choose a white that is not in the palette. Paint another square on the magnified screen.

Notice that this time the ramp is four pixels across, but the colors used in the ramp are much closer to the target color of white, so the ramp is not as noticeable. DeluxePaint chose a color from the palette to start its ramp with. The color it chose is color 3, which has an RGB value of 13, 13, 13, very close to white. When DeluxePaint chooses a color from the palette to begin a ramp, it searches the palette from the left and chooses the first color that is acceptable. And to determine which color is closest, the program compares the colors in the palette with the color you are painting with.

So far we've been showing you what happens to the HAM color that you are painting down and how DeluxePaint ramps to create that color. Keep in mind, however that if the color you are painting ON is a HAM color, the program will have to compute a ramp to create that color also, so you will see a ramp on the right side of your brush. When DeluxePaint creates this ramp, priority is given to the brush color when selecting a color from the palette to begin a ramp.

- ❖ When you paint with a HAM color using single pixel brush, you are actually painting with the closest color that the program can ramp to in a single pixel. If you need to do detail work, you should put the colors for the fine details in the palette (the first 16 colors of the color set).

The construction of a useful palette is an important part of successful painting in HAM. With a little experience, you'll find the palette that works best for you.

Combining Images

If you plan to combine images in HAM by loading in custom brushes, it is best to create all of the separate images using the same palette. This is especially true if you are using HAM animbrushes to be combined with a HAM background.

We included a HAM background (AquariumBackground) and two HAM animbrushes (AngelFish and BettaFish) on the Art2 disk for you to experiment with. These images all use the same palette, so they combine fairly well. Load the background image and create frames to use the animbrushes against the background. The brushes look especially good when stamped with Translucency set to 30 percent.

When you load a 32 or 64 color brush into a HAM picture, the brush is automatically remapped to use the current picture's palette. So the brush will immediately look correct on the screen. The brush's palette is also loaded intact, so you can choose **Palette>Use Brush Palette** if you want to use the brush palette. Then load the brush again to remap to the brush palette.

When you load a brush that is 16 colors or less into HAM, the brush is not remapped. You can choose to either use the brush palette or remap the brush.

Remember that DeluxePaint IV loads and saves palettes and color sets. This should make it much easier and faster for you to combine palettes.

HAM Fringing

Fast Adjust

Sometimes when you are moving a brush on the screen in HAM mode, you will see fringe on the right side of your brush. This happens when the colors in the picture are HAM colors, that is, not from the 16 color palette. DeluxePaint attempts to correct the fringing when you hold the brush still so that you can see how the image will actually look when you stamp down the brush. If you turn off the **FastAdjust** option in the Prefs menu (this option in ON by default), DeluxePaint will attempt to correct the fringing effect even when you are moving the brush. The advantage is that your brush will always look its best, but the brush will also move more slowly when you move it around on the screen.

Recompute

HAM Fringing will be especially noticeable when you load images from some other programs that support HAM. If you load an image from another program and find that the fringing effect along the right side of your brush is severe, choose the **Recom-**

pute option in the Color menu. This option remaps the picture to its own palette to eliminate the fringing.

Changing a Picture's Colors in HAM

Many artists are accustomed to adjusting the colors in their image by changing the RGB values of the color in the palette and thus automatically changing all instances of the color in the picture. Since HAM colors are not tied to the palette, you cannot directly change them by changing the RGB values. You can, however, change the colors globally with the **BG->FG** option in the Color menu. Here's an example of how to do it:

▶ Choose **Palette>Default Palette** from the Color menu.

❖ If it is not already displayed, press p to display the Color Mixer.

▶ Click on an empty color slot in the Mixer.

If there are no empty slots, create some using the Delete button in the Mixer. Make sure the empty slots you create are not one of the first 16 colors.

▶ Change the RGB slider settings to 12, 13, 0.

This should produce a bright yellow color that is slightly different from the yellow in the palette. Because it is not one of the first 16 colors, it is a HAM color. Paint on the screen with this new yellow.

▶ Click on another empty slot in the Mixer and change the RGB sliders to 15, 3, 4. This should produce a bright red color.

▶ With the right mouse button, click on the yellow color you created to make it your current background color.

At this point the Color Indicator in the Color Mixer should show that your foreground color is bright red and your background color is bright yellow. You should also have some of the bright yellow background color painting in your picture. In the next step, we'll change the yellow color in your picture to the red color.

▶ Choose **BG->FG** from the Color menu.

After a few moments, DeluxePaint repaints your picture with all of the yellow turned to red.

The **BG->FG** option changes every instance in the picture of your current background color into the current foreground color. In our particular case this meant that every pixel in the picture that had the RGB values 15, 3, 4 (yellow) changed to the foreground color (red).

As you saw, it takes a moment for DeluxePaint to search through your image to change all of the pixel colors, but it performs this function much more rapidly that you ever could.

Color Processing Options

To give you greater flexibility when working with HAM images in particular, DeluxePaint IV includes new effects for painting. The most notable of these are the Translucency and **Process** options in the Effect menu. We'd like to show you a couple of these very quickly just to give you an idea of why they are there and how to use them.

Before you begin:

- ▶ Load the picture titled Retrospective from the Art1 disk.

Translucency

The translucency option lets you combine a specified percentage of the colors in your brush with the colors in the image. This is especially useful for overlaying one image on another. Let's try a quick example.

- ▶ Select the Brush Selector tool and pick up the eye image in the upper right portion of the picture as a brush.
- ▶ Press **F10** to hide the Menu Bar and Toolbox.
- ▶ Choose **Translucency>On/Off** from the Effect menu (or press `Alt-t`).
- ▶ Press **F9** to redisplay the Menu Bar.

Notice that a T appears in the Menu Bar to tell you that Translucency is on.

- ▶ Move the brush over the image of the earth viewed from space and stamp down the brush.

You'll see DeluxePaint overlay 50% of the eye image over the earth image. You can also change the level of translucency by choosing **Translucency>Settings** from the Effect menu. Since Translucency is an Effect rather than a Mode, it will also change the way shapes are painted on the screen. And, you can combine the Translucency effect with any of the Process effects to exercise greater control over the strength of the process effect.

- ▶ Choose **Translucency>On/Off** from the Effect menu to turn Translucency off.

Process

The **Process** options in the Effect menu let you paint with different combinations of the HSV levels of your brush. Tint paints with a combination of Hue and Saturation. Hue paints with only the hue of the brush, if you're painting with a solid color, this is a good way to convert a color image to a monochromatic image as we'll see in a moment. Value paints with only the value of your foreground color, and is a great way to add shadows or highlights to an image, or even just to lighten the image overall. We'll take a quick look at the Hue option to give you an idea of how the Process options work.

- ▶ Choose **Process>Hue** from the Effect Menu to make it the current process option. Then Choose **Process>On/Off** to turn the Process option on.

A P appears in the Menu Bar to tell you that one of the **Process** options is active.

- ▶ Press **F10** to display the Toolbox. Choose the light pink as your current foreground color. Select the Filled Rectangle tool.
- ▶ Press **F10** again to hide the Toolbox. Draw a filled rectangle over the eye image in the upper right corner of the picture.

In a moment, the eye is painted over with pink and all of the colors in the image are shifted to pink. Using the Hue option does not affect the Saturation or Value of the colors in the image, so the resulting image is a monochromatic version of the eye. If you want to see the effect against the original, repeatedly press **u** to undo and redo the change.

As we mentioned above, the Translucency and Process options can be combined. Try some combinations of options on other areas of the picture. For example, try the Tint option with Translucency set to a high number to very lightly tint an area of the picture.

This section covered only a small part of the world of HAM painting. We hope that the ideas we've presented here helped you better understand HAM mode and that you'll experiment freely with the new options designed for this mode.

Tutorial Four: The World of Stencils

In the following set of exercises you will learn how to create and use stencils within DeluxePaint IV. Although stencils are primarily used for producing quick, uniform lettering by amateur signwriters, they have uses that go far beyond that. Airbrush artists, for example, use stencils (which they call *friskets*) to cover certain areas of their work while they airbrush other areas.

DeluxePaint makes it easy to create a stencil for any part of an image, without the need to redraw the image. All you do is specify the colors that make up the stencil, and DeluxePaint does the rest, even if the image is intricate.

Here's how it works: when you make a stencil for a particular set of colors, you lock (and thus protect) any parts of the picture that are made up of those colors. This means that when you have a stencil for a particular set of colors, you cannot paint over those colors until you turn the stencil off. It also means that you can essentially paint a picture backwards, from the foreground to the background, because you can use stencils to mask any foreground objects from the colors you are using for the background objects.

Before You Begin

- ▶ Choose **Screen Format** from the Picture menu and set your screen format to 320x200 with 32 colors.
- ▶ Choose **Load** from the Picture menu and load the picture named StencilSet from the Picture drawer on the Art1 disk.

Distant Snowcaps

The left part of the Stencilset picture shows a distant mountain range behind a green field and under a colorful sky. (If you followed the preceding tutorial, you'll notice that both the sky and the field were created with a Gradient Fill, in a fraction of the time it would take using more traditional techniques.) Note that the mountain range is actually made up of three ranges, with the more distant ones painted in lighter shades than the nearer ones. In this exercise, we will put a snowcap on the most distant range without disturbing any other parts of the picture. This would be a tall order for any other graphic medium, but is surprisingly easy with DeluxePaint. Let's see how DeluxePaint does it:

- ▶ Choose **Stencil>Make** from the Effect menu to display the Make Stencil requester. Click Clear, click on Color 8 (the one at the top of the second column), click Invert, and then click Make.

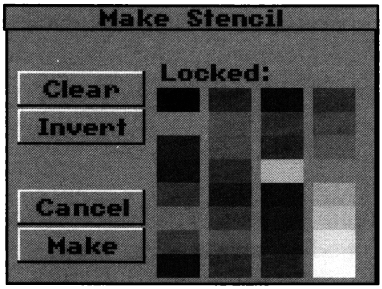


Figure 4.17 Make Stencil requester

With four simple clicks you have created a stencil that locks every color in the picture except Color 8, the color of the most distant mountain range. The first click cleared the picture of any stencils, the second selected the stencil color, the third click inverted the stencil configuration (making everything except Color 8 a stencil), and the fourth made the stencil. To let you know that you have a stencil active, an "S" appears on the Title Bar.

Note that clicking Invert simply inverts the current stencil configuration, saving you the trouble of clicking all the colors except the one you want to paint on. This is useful if you want to paint on one or two selected colors to the exclusion of the rest; if you want to create a stencil to lock only one or a few colors, you don't need to use invert.

The next step is to paint the snow on the distant mountain range:

- ▶ Press `p` to display the Mixer. Change Color 1 (the second color in the palette) from grey to white by dragging the RGB sliders all the way to 15.
- ▶ Select white as the foreground color, and then select the one-pixel brush and the Airbrush tool. Move the cursor over to the distant mountain range and spray a snowcap on it.

Because every color except that of the most distant mountain range has been locked, you can spray without fear of splattering any adjoining colors.

Note that although the white you are spraying on the mountain range is one of the locked colors, it is not itself locked while you are applying it. This means that you can paint over it with another color (such as the original color of the mountain, if you don't like the look of the snowcap) just as though it were unlocked.

To lock a recently applied color, just select **Stencil>Remake**. You don't need to display the Stencil requester again, because the configuration is still as you want it. This also means that you can use the "Again" key (**a**) to update your stencil, if **Remake** was your last menu command.

The Again rule is simple: press **a** whenever you want to repeat the immediately preceding menu command, to save you moving the mouse up to the Menu Bar and through menu and submenu options. If your last menu command produced a requester, then pressing a will produce that same requester, without the need for menu selections.

Sunrise in the Rockies

In this exercise, we make the sun rise *behind* the mountains, so we need to lock every color except the sky. Here's how:

- Display the Make Stencil requester. (Color 8 should be the only unlocked color in the requester.) Now click Color 8 to lock it, and then click Colors 0 (black) and 12 through 16 (the sky colors) to unlock them. (Color 12 is halfway down the second column, and Color 16 is at the top of the third column.) Click Make.

You have now locked every color in the landscape except the sky colors. Now let's make the sun rise:

- Choose **Stencil>Off** from the Effect menu to turn the stencil off.

In DeluxePaint IV, your stencil affects picking up a brush — you can only pick up areas that are not in the stencil. Since the orange shades in the sun are part of the stencil, you turned off the stencil momentarily to pick up that area of the picture.

- Click the Brush Selector, move the large cross-hair over to the sun image (on the far right of the screen) and pick it up with the left mouse button. Move the brush over to the mountain range.
- Choose **Stencil>On** from the Effect menu to turn the stencil on.

Did you see the sun move *behind* the mountains and then peek through? This is because every color — except the sky colors and the background— is locked, and so will not accommodate the sun brush. When you are satisfied with the placement of the sun, click to stamp an image of it there.

Cutting Some Z's

In this exercise we will explore further aspects of DeluxePaint's powerful stencil editor. In particular, you'll see how to turn stencil colors on and off from any part of your picture, not just from the Make Stencil requester.

- Display the Make Stencil requester and click Clear to clear the stencil. Now move the cursor outside the requester and click the large Z shape. Click Invert and then click Make to return to the painting screen.

Did you notice that when you clicked the Z the Make Stencil requester responded by locking that color? This means that you can lock and unlock colors directly from your image just by clicking them. Note that clicking with the left mouse button adds a color to the stencil and clicking with the right mouse button deletes a color from the stencil. And to make it easy to find the colors you want to lock or unlock, you can move the Make Stencil requester to any part of the screen just by moving the cursor to the top of the requester, pressing the left mouse button, and dragging it to a new position.

Now let's see what we can do with the stencil we just created:

- Press the ` (accent grave/tilde) key to turn off the stencil.

Pressing ` is the same as choosing **Stencil>On/Off** from the Effect menu. This is a very important keyboard equivalent for working with stencils.

- Click the Brush Selector and pick up the textured area to the right of the Z.
- Press ` to turn on the stencil.
- Move the cursor over to the Z and watch what happens.

Did you see the textured brush appear behind the Z? Because all the colors except the Z are locked, it looks like you're viewing the textured brush through a Z-shaped window. Now, when you place the textured brush behind the Z and click, you will fill the Z with the textured pattern.

Fixing the Background

By using a combination of stencils and fixing the background, you can define a stencil by area rather than color. This lets you confine a stencil to a particular area of the page, without forcing you to lock every instance of a particular color. Let's take a closer look:

- ▶ Pick up the small clump of pine trees from the right-hand side of the page. From the Effect menu, choose **Background>Fix**.

You have just fixed the picture to the background (the "B" in the Title Bar tells you so), which means you can always return to that picture by clicking CLR. Thus, you can stamp pine trees all over the landscape and then return to the original picture at any time. You can also fix the background successively, updating the picture from the previous "fix." (As we saw earlier, you can use the "Again" key (**a**) to repeat the immediately preceding menu command.)

- ▶ For the purpose of this exercise, go ahead and stamp a few clumps of pine trees in front of the closest mountain range. Now let's turn that collection of pine trees into a stencil:
- ▶ From the Effect menu, select **Background>Lock FG**.

This last action turned the foreground (i.e., everything you added to the picture since fixing the background) into a stencil, but without affecting any other part of the picture that uses those same colors. Try it and see. Move your pine-tree brush over to the pine forest and you'll see that your brush goes behind the forest but in front of everything else. You can remove this stencil either by turning the stencil off or making a stencil by locking colors.

The color and area methods are mutually exclusive, so using one method automatically negates the other. And as is the case with regular stencils, clicking CLR does not clear the stenciled area — it is protected until you turn it off, just like the fixed background.

Painting a Stencil

A more powerful way to define a stencil by area is to "paint" it. You can do this with DeluxePaint IV's **Stencil>Paint** option. Painting a stencil can be invaluable for protecting areas that are not easily defined by color. In the next few steps we'll show you how to "cookie-cut" an area of your image to create the first of the two logos in the StencilSet image.

- ▶ At this point you should still be working with the StencilSet picture from the exercise above. If you still have Fixed Background active from the previous exercise, choose **Background>Free** from the Effect menu.
- ▶ Choose **Stencil>Make** from the Effect menu. Click Clear and Make in the requester to clear your stencil.

When you use Stencil Paint, you can either add to an existing color-based stencil or you can start from scratch. When you choose this option, DeluxePaint calculates the stencil based on the colors that are selected in the Make Stencil requester and then presents you with a screen that you can use to add or subtract areas from. So, to start from scratch, you need to clear the Make Stencil requester as we did above.

In the next few steps, you'll pick up a brush to paint in the stencil with and turn on Stencil Paint to paint down your stencil. Then you'll reverse the stencil and pick up a new brush.

- ▶ Click the Brush Selector tool and pick up the red, yellow, and green logo as a custom brush.
- ▶ Choose **Stencil>Paint** from the Effect menu.

In a moment, your image is dimmed and a lower-case "s" appears in the Menu Bar to show that you are in Stencil Paint mode.

- ▶ Move your brush over to the mountain range so that the sunrise is in the lower part of the circle and click with the left mouse button.

Painting with the left mouse button adds to the stencil (which you see as lighter colors) and painting with the right mouse button subtracts from the stencil. By clicking down your brush, you created a stenciled area that is the shape of the brush. Now you'll exit Stencil Paint and reverse the stencil.

- ▶ Choose **Stencil>Paint** to turn off the mode and create your stencil.

It's important to correctly turn off the Stencil Paint mode the same way you entered it. If you try to use other options while in Stencil Paint, DeluxePaint may turn off the mode for you, but there is no guarantee that in those instances it will save the changes to the stencil. If you think you'll be using this feature a lot, you should get used to the keyboard equivalent: Ctrl-s.

- ▶ Choose **Stencil>Reverse** to reverse your stencil so that all areas except the logo-shaped area of the mountain range is protected.
- ▶ Choose the Brush Selector tool. Pick up the mountain range as a brush. And press the ` (accent grave) key to turn off the stencil.

Now you should be holding a brush like the first of the logos in the StencilSet.

With a little creativity, you can combine Stencil Paint and the new gradient fills we showed you earlier in the chapter to create some stunning effects.

Stencils in HAM

When you're working in HAM, the Make Stencil requester is a bit different from the one you see in other modes. This requester doesn't attempt to show you which of the 4096 possible colors you have locked. Instead, it gives you powerful ways to lock colors individually or based on a tolerance level. It then lets you view the stencil as you would by choosing **Stencil>Show**. In the next pages we'll take a quick look at the features of the Make Stencil requester in HAM mode.

❖ Due to the heavy computational and memory requirements of the Make Stencil option in HAM, this feature will be somewhat slow on lower-end Amigas. If your Amiga has no more than 1MB of RAM or 512K of Chip RAM, we recommend that you use the Stencil>Paint feature to create stencils in HAM. However, if you are patient, you might want to work through this section; it might be just the thing for you.

Before we begin:

▶ Choose **Screen Format** from the Picture menu and change your screen format to Lo-Res 320x200 HAM.

▶ If you don't already have the StencilSet picture loaded, load it now and choose NO to converting to the screen format of the file.

▶ Choose **Stencil>Make** from the Effect menu. You'll see a Make Stencil requester like the one in Figure 4.18.

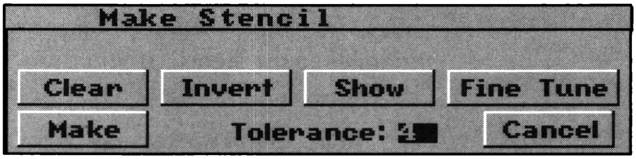


Figure 4.18 Make Stencil requester in HAM

The Clear, Invert, Make and Cancel buttons in this requester perform essentially the same function as they do in the Make Stencil requester in other modes. The important new concepts we want to show you are Show, Fine Tune, and Tolerance.

Tolerance

The tolerance setting lets you click on a single color in your picture and simultaneously lock (or unlock) all "similar" colors in the image. The Tolerance number determines how different a color can be and still be considered "similar" to the one you clicked on. A low Tolerance number requires that the colors be very similar, while a high Tolerance number locks colors that may be very different from the color you clicked. The range of Tolerance values runs from 0 to 48. At 0 tolerance, only colors that are identical to the color you click on will be affected. At 48 tolerance, all colors will be affected.

TECHNICAL NOTE Tolerance is calculated in the RGB cube color space. Each increment of tolerance represents a change of 1 on any of the RGB values of the color you clicked on.

To see how tolerance works in a practical application, we'll use it to lock the green colors in the StencilSet image. When you first open the Make Stencil requester, Tolerance is set at 4. We'll leave it at four as we choose our first color.

- ▶ Move the cursor down to the bottom of the green grass area of the sunset image and click once on the lightest green.

Clicking on a color with the left mouse button tells DeluxePaint that you want to lock that color. Notice that the color appears in a box beside the Tolerance option, and a black "lock" bracket appears beside the color to show that you have locked it. You could click Make to exit the requester with your stencil, but instead, we'll use the Show button to confirm that we locked the colors we wanted.

- ▶ Click the SHOW button to show your stencil.

After a moment of calculations, DeluxePaint will dim your image and show your stencil as lighter areas in the image just as if you had chosen **Show** from the Stencil submenu. You'll see that many more greens than the one you clicked on are stenciled. But not all greens are stenciled, because your tolerance was set to only 4. You'll also see that part of the green triangle from the Electronic Arts logo and the green of the trees is also stenciled.

Now suppose that you actually wanted to select more greens than the ones that were stenciled in this first attempt. You can do this in two ways: either click on another green that is not stenciled to lock it and all colors similar to it; or increase the Tolerance setting. Let's try the latter method now:

▶ Click in the Tolerance edit field and change the number to 8.

▶ Click SHOW once to turn off the option, and when the image has updated and the requester reappears, click Show again to recalculate your stencil with the new Tolerance setting and show it.

Now you'll see that two thirds of the greens are selected in your image.

❖ If you need to select a large area of your image quickly, high tolerance numbers can help you a lot. However, to get that help you sacrifice some control over which colors get stenciled. Of course, you can always go back and adjust the stencil with the Fine Tune option as you'll see below.

Fine Tuning the Stencil

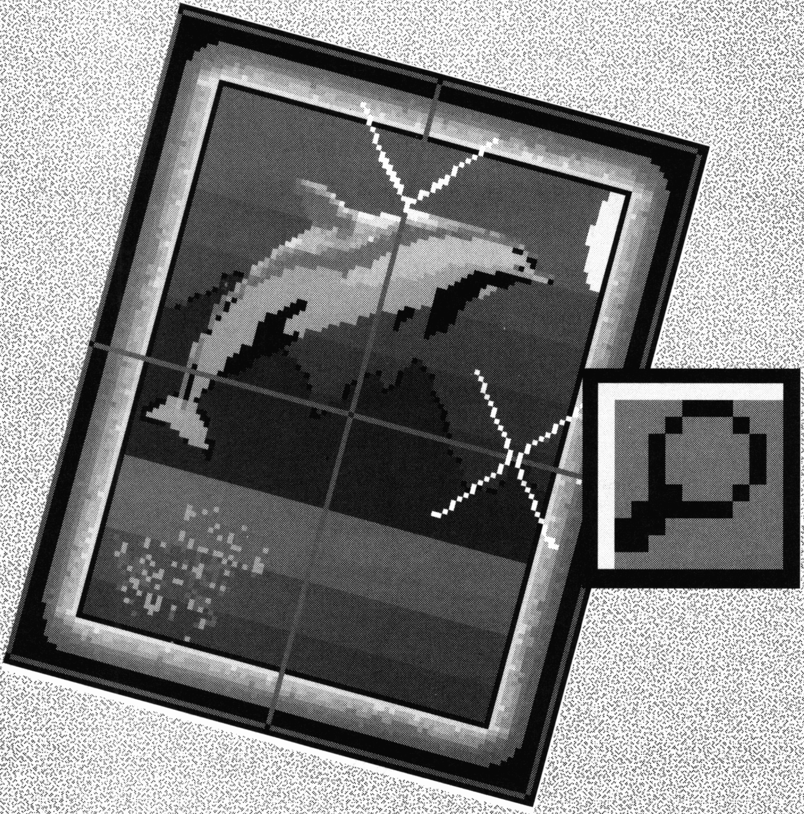
Now that you've seen how to add to the stencil and use the Tolerance setting, we'll take a quick look at fine tuning the stencil. We're going to use Fine Tune to subtract a color from your stencil, but you can also use Fine Tune to add colors to the stencil.

▶ Click the Fine Tune option to turn it on.

▶ Move the cursor over to the middle of the stenciled grass and click with the right mouse button to subtract a color.

▶ Click SHOW once to turn off the option. Click SHOW again to recalculate and show your stencil with the color removed.

Fine Tune lets you add or subtract single colors from your locked set without having to change the Tolerance level. Fine Tune always adds or subtracts only the color you click on, though you are certainly welcome to click on whatever colors you like.



5

Working with Perspective

Chapter 5: Working with Perspective

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This chapter explains DeluxePaint's powerful Perspective mode. Perspective lets you paint in three dimensions, which can give your pictures a true feeling of depth. Perspective is a complex feature, so we strongly recommend that you become familiar with the program before you venture into this area. We've tried to make this explanation as clear as possible, but be aware that the steps we list assume that you understand other program features.

Three-Dimensional Model

When you paint in Perspective mode, you are working with a three-dimensional representation of the two-dimensional space that is available on your screen. To visualize this model it might help to think of your computer screen as the front side of a box.

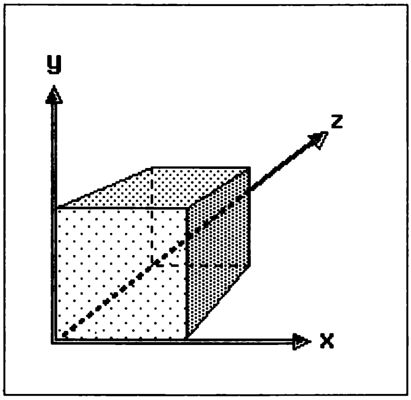


Figure 5.1
The 3D Space and Screen Coordinate System

Usually, when you paint, the mouse moves your brush in only two directions: horizontally and vertically. But when you move and rotate your brush in Perspective mode, you add a third direction to the motion: backward and forward. To move the brush into the distance or towards you, you'll move it on the Z axis of the coordinate system shown above.

You'll learn more about the coordinate system later in this chapter. For now, just remember that in it's default settings, the screen coordinates operate as shown in Figure 5.1; the X axis runs horizontally across the screen, the Y axis runs vertically, and the Z axis runs backward into the screen.

Rotating a Brush in 3D Space

The key to working in Perspective is rotating the brush. In this brief section, we'll show you how to rotate your brush using the *numeric keypad*. Before you begin, you need a brush to rotate.

▶ Load the Dolphin brush from the Art1disk.

- If you are NOT in HAM, choose **Palette>Use Brush Palette** from the Color menu. If you are in HAM, move to the next step.

After you have a brush, you can enter Perspective mode.

- Choose **Perspective>Do** from the Effect menu, to enter the Perspective mode.

A small cross hair appears in the middle of the screen to indicate the Perspective Center (or line of view), and your brush is enclosed in a *wire-frame* with a large cross hair over it. In our example, you will also see three zeros on the right half of the Title Bar. These indicate the current rotation angles of the brush. The numbers are all zeros because we haven't rotated the brush yet.

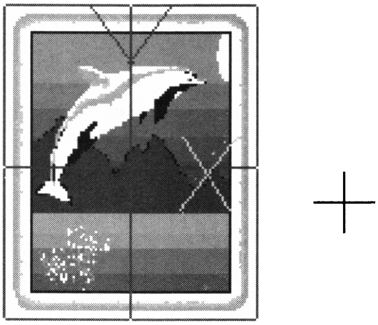


Figure 5.2 Screen in Perspective Mode

The cross hair on your brush makes any brush rotations easier to see, and it will help you position the brush when it changes sizes. An important feature of the cross hair is that it indicates the X and Y axes of the brush. The Z axis of the brush runs perpendicular to the other two axes, just like the screen's Z axis. Figure 5.3 shows the Brush axis system.

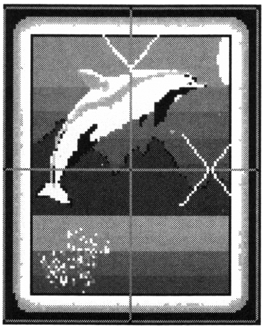


Figure 5.3
Brush cross hair
and coordinate system

To rotate the brush, use the numeric *keypad* on the right side of your keyboard. Figure 5.4 shows how each of the keys rotates the brush.

❖ All numerical keystrokes in Perspective mode refer to the *numeric keypad*. You'll use the keypad to rotate images. Sometimes you'll use the Shift key in combination with the keypad to rotate an object a fixed number of degrees (more about this in *Angle Step*, below).

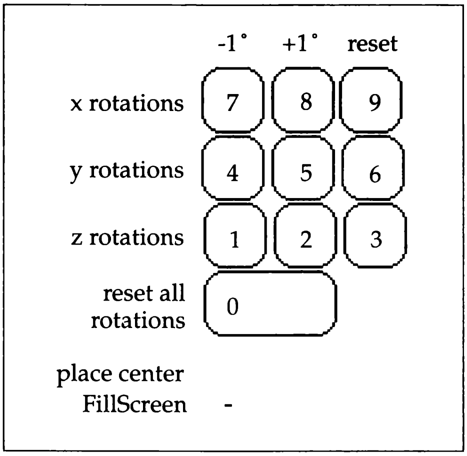


Figure 5.4
Brush rotations mapped to the keypad

We'll try each of the rotations in the next few steps so you get a feel for moving in 3D. We'll start off with the simplest rotation, that is, a rotation on the Z axis with the brush in its normal 0,0,0 orientation. This is the simplest rotation, because no part of the brush moves off the plane of your computer screen.

▶ Hold down `2` on the *keypad* for about 5 seconds.

The Dolphin disappears and the wire frame rotates clockwise on its center (the position of the pointer). Notice that the third number along the right side of the Title Bar has increased as the rotation angles increased. Figure 5.5 illustrates rotation on the Z axis.

▶ Press `1` repeatedly until the numbers along the right side of the Title Bar show 0, 0, 0 as the brush rotation.

When the brush is back to the 0, 0, 0 position, the Dolphin reappears inside the frame. This is a handy visual cue that the brush is at it's original orientation. Later, when you begin moving the brush in three-dimensional space, you'll see that the same rule applies to movement — if the brush is back on it's original plane it reappears inside the frame.

- ❖ Displaying the brush is dependent on memory availability; your brush may not appear even when in its original orientation if it is large or memory availability is low.

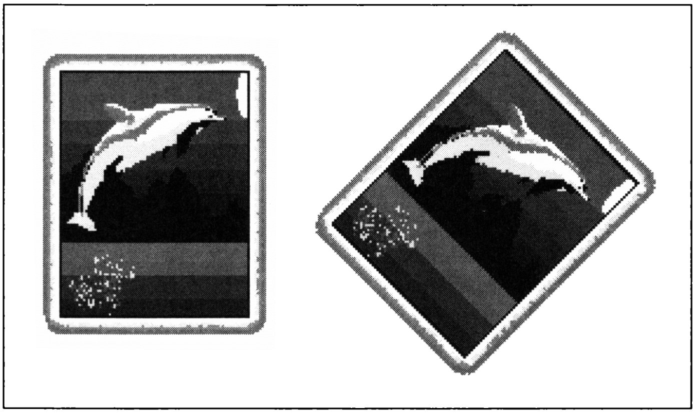


Figure 5.5 Brush Rotation on Z Axis

Rotating on the other axes works just like rotating on Z, but when you rotate on the other axes, the brush moves off the plane of the screen and into the third dimension. Let's see how this works by rotating on X.

- ▶ Move *(don't drag)* the brush to the lower left corner of the screen. Hold down `7` on the keypad.
- ▶ When the brush frame has rotated to about -45°, release the 7 key, and click to paint the brush.

As you rotate the brush on the X axis, it appears as though the top half of the brush is turning into the screen and the bottom half is turning outward. As a result, your painted brush is set at an angle to the screen as shown in Figure 5.6.

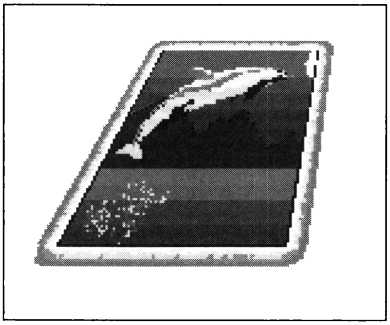


Figure 5.6 Brush Rotation on the X Axis

- ▶ To return your brush to its original orientation, press 0.

Resetting the Brush Rotation

The last step introduced an important keystroke. Any time you need to reset the brush to its original orientation of 0,0,0, press `0` on the keypad. If you get lost in the world of 3D, you can always get back to the beginning with this simple keystroke.

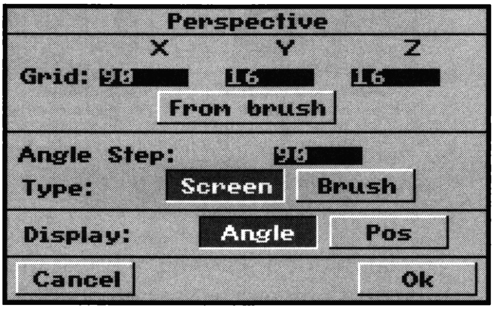
The Angle Step

To rotate on the Y axis, you use 4 and 5 on the keypad. This time we'll use the Shift key to rotate by a larger increment, automatically.

- ▶ Move your brush to the lower right corner of the screen. Hold down the Shift key and press `4` on the keypad. Your brush instantly rotates -90° on the Y axis. Click to paint the brush.
- ▶ Press 0 on the keypad to return the brush to its original orientation.

When you use the Shift key with one of the keypad keys, the brush rotates by the Angle Step. The default Angle Step is 90°, but you can change it to any angle you like in the Perspective requester.

- ▶ Choose **Perspective>Settings** from the Effect menu to display this requester, or right-click on the Grid tool while you are in Perspective mode.



Grid: X 90 Y 16 Z 16

Angle Step: 90

Type: Screen

Display: Angle

Figure 5.7 Perspective requester

When using perspective, 90 degrees is the most common angle, so leave it there for now.

- ▶ Click Ok to return to the painting screen

Rotation around the Handle

When you rotate a brush in Perspective, the rotation always occurs around the brush handle. In the preceding examples, the brush was held by the center (the default position), so the rotations always occurred around the center of the brush. Let's look at the difference between rotation around the center and rotation around the corner of the brush.

▶ Click CLR to clear the screen. Position the brush near the middle of the screen. Hold down the Shift key and press 2 on the keypad to rotate 90° on the Z axis. Press `Shift-2` three more times to set the brush back to 0,0,0.

You've seen this rotation before, but we had you repeat it to compare this with rotation around the corner of the brush.

▶ Keep the brush in the same location. Press `Alt-x` on the keyboard.

This moves the brush so that it is held by the lower right corner. Note the position of the arrow cursor. You can also do this by choosing **Handle>Corner** from the Brush menu.

▶ Press `Shift-2` to rotate the brush around the new handle position.

Figure 5.8 illustrates the difference between rotation around the center and rotation about the corner.

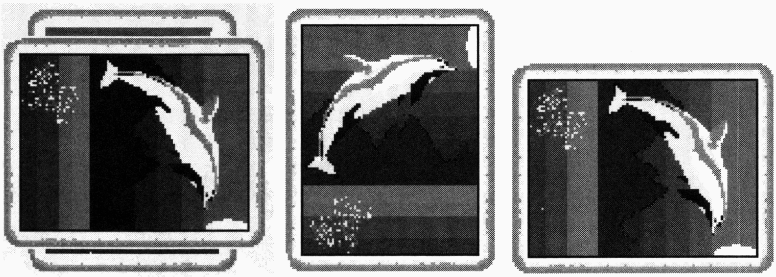


Figure 5.8 Rotating a brush with the handle at the center and at the corner of the brush

Screen Versus Brush Coordinates

So far in our discussion of brush rotations, we've always rotated the brush on one of the two possible coordinate systems. If you look back to Figure 5.7, you'll see that below Angle Step in the Perspective requester there is an item labeled Type with two buttons: Screen and Brush. We've been rotating in the Screen coordinate system. In the next few steps, we'll demonstrate the difference between the two rotation systems.

INFORMATION □ If you are familiar with rotation systems, you'll recognize that this Screen coordinate system is based on Euler angles.

Before beginning this brief example, make sure your screen is clear. When it is:

- Choose **Handle>Center** from the Brush menu; and press `0` to reset your brush to it's original orientation.

To make this example clearer, it will help if the Angle Step is set to something other than 90°. In the next step we'll have you change it to 45°.

- Choose **Perspective>Settings** from the Effect menu (or right-click the Grid icon), to display the Perspective requester.
- Click in the right side of the Angle Step edit field, backspace to erase the 90 setting and type `45`. Click Ok to close the requester and use the new setting.

Now let's try a rotation in the screen coordinate system:

- Position your brush in the lower left corner of the screen. Press `Shift-2` to rotate 45° on the Z axis. Now press `Shift-7` to rotate -45°on the X axis.
- Click to paint the brush down.

Notice that when you rotated the brush on the X axis, the Screen's axis was used. The brush's X axis was tilted sideways, but the brush still rotated backward into the screen. Also notice that the rotation angles appear in the Title Bar.

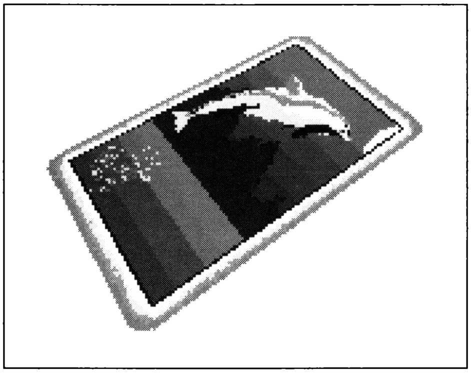


Figure 5.9 Rotating the brush 45° on Z and X in Screen coordinates

Now we'll change the setting to Brush angles and do the same rotation to see the difference.

- Right-click the Grid tool to display the Perspective requester. Click the button labeled Brush and click Ok.
- Press `0` to reset your brush to its original orientation.

- Position the brush in the lower right corner of the screen. Press `Shift-2` to rotate 45° on the Z axis. Now press `Shift-7` to rotate -45° on the X axis.
- Click to paint the brush down.

In the Brush coordinates system, rotations always take place about the brush axes, regardless of the current orientation of the brush. In this example, the X axis was positioned diagonally after you rotated 45° on the Z axis; as a result, the brush rotated on the diagonal axis instead of rotating straight backward into the screen.

You'll also notice that the angles shown in the Title Bar are not the angles that you rotated. The Title Bar always shows the rotation angles for the *Screen* coordinate system. This allows you to reproduce your brush rotation by switching to Screen angles and rotating the amounts indicated in the Title Bar.

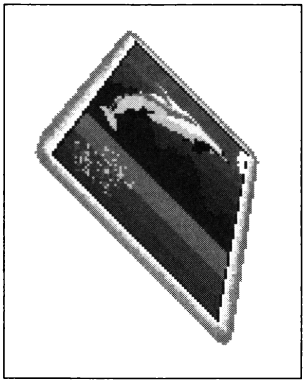


Figure 5.10
Rotating the brush 45° on Z and X in Brush coordinates

DeluxePaint offers both Screen and Brush coordinate systems for rotation, because each of the systems has unique merits:

The Screen coordinates system is often consistent with the notion of the three screen coordinates defining the 3D space. More importantly, the Screen coordinates system is reproducible: you can jot down the rotation numbers in the Menu Bar and reproduce the same brush orientation simply by rotating to the same angles. The results of multiple rotations are the same no matter what order you rotate in.

The Brush coordinates system is usually easier to visualize if you are rotating at angles other than 90°. So you can usually produce the desired brush orientation without much difficulty. Unfortunately, the cumulative effect of separate rotations on the brush axes are not reproducible unless you make the exact same rotations in the exact same order. You'll notice that the angles given in the Menu Bar when you rotate using the Brush coordinates are actually the angles for the Screen coordinates system; this is so you will be able to reproduce your brush rotation, though you will have to use Screen angles to do it.

Now that you've seen how to rotate your brush in three dimensions, the next section will show you the ins and outs of moving a brush around in all three dimensions.

Moving in 3D Space

Before you begin this section clear the screen.

▶ Choose **Perspective>Reset** from the Effect menu to reset all perspective settings, *including* Angle Type, to their defaults.

▶ Load the brush named Blockbrush from the Art1 disk. Choose **Palette>Use Brush Palette** from the Color menu.

▶ Make sure you are in Perspective mode.

Moving on the Z axis

When your brush is in its original orientation (0, 0, 0), moving your mouse moves your brush along the X and Y axes. Try it right now:

> Move your mouse forward and watch how your brush moves up on the screen. Move your mouse backward and your brush moves down on the screen. Likewise, moving the mouse left or right moves the brush left or right.

Because your mouse can move in only two dimensions (the third direction would require you to lift it off the desk), it can move your brush in only two directions. You can move your brush in the third dimension by using the keyboard. One method is to move the brush straight back along the Z axis only:

▶ Position your brush in the lower left corner of the screen, hold down the Shift key and press the at key (@) several times.

Each time you press Shift-@, the brush moves backward along the Z axis. It appears as though the brush is getting smaller, but in fact it is moving away from the front of the screen. To move the brush forward along the Z axis, you use the colon key(:).

▶ Hold down the Shift key and press the colon key (:) once.

Notice that the @ and : keys move the brush toward and away from the cross hair in the middle of the screen. This cross hair defines the Perspective Center, which is best thought of as the point of view. No matter where you place the brush on the screen, if you move the brush using the 'at' key, the brush will move into the distance and toward the Perspective Center.

When you use Perspective, you'll often want to move your brush backwards and left and right along a plane. The effect is of a brush moving across the floor. DeluxePaint lets you do this by holding down the Ctrl key while in Perspective.

▶ Press `0` to reset your brush to its original orientation.

▶ Position the brush near the bottom of the screen, hold down the Ctrl key and move your mouse forward and backward.

With the Ctrl key held down, the brush moves away along the Z axis when you move the mouse forward. In this way, you can easily move in the X and Z axes instead of the usual X and Y axes.

3D Coordinates

DeluxePaint IV lets you see the position of your brush in three dimensional space when you are in Perspective mode. This is useful if you need to align your brush precisely.

▶ Press the \ key and look at what happens to the angles in the right side of the Title Bar. Now hold down the Ctrl key and move the mouse forward and backward.

Pressing the \ key toggles the Display option in the Perspective requester between Angle and Pos (position) (see Figure 5.7).

▶ Press the \ key again to return to displaying angles in the Title Bar.

Laying Down the Brush to Move in 3D

Another way to move into the distance is to lay the brush down and then move it on its own Y axis. Rotating the brush 90° on its X axis makes the brush's Y axis act like the screen's Z axis. Figure 5.11 shows what happens to the different axes during perspective rotation.

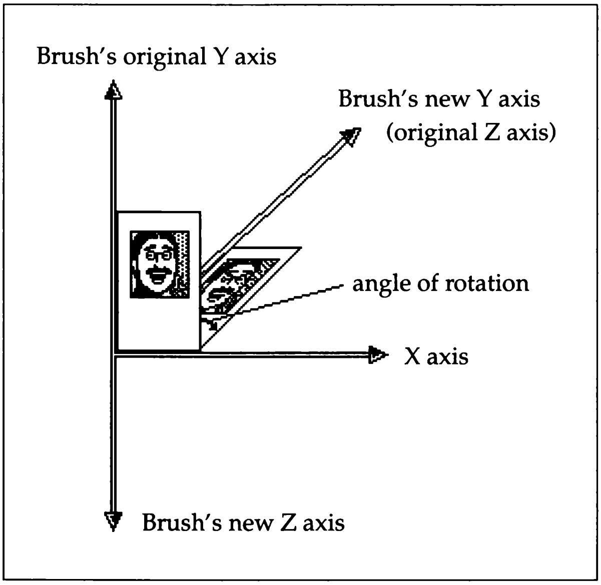


Figure 5.11 Brush coordinate system before and after rotation

Let's try it once to see how it works.

- ▶ Press `0` to reset the brush to its original orientation and position the brush in the lower left corner of the screen.
- ▶ Press `Shift-7` to flop the brush down into the screen. Now move the mouse around.

You will quickly discover that moving the mouse forward and backward moves the brush into the screen and back out instead of up and down. This is because the mouse moves the brush on the plane defined by the brush's X and Y coordinates.

- ▶ Move the brush to any new position and press `Shift-8` to turn it back up on end. Paint the brush down.
- ▶ Use the combination of Shift-7 and Shift-8 several times until you are comfortable with how these keys help you move in the third dimension.

Perspective Plane

You might have noticed that when you flopped the brush down by rotating on it's X axis, the brush moved on a plane below the Perspective Center. Remember that when the brush is in its original 0, 0, 0 orientation, it moves on a plane that is roughly the equivalent of the computer screen. When you rotate the brush, you change the orientation of the plane. The plane can be at almost any angle to Perspective Center. The easiest way to see this is to fill the perspective plane you've defined.

- Press `0` to reset your brush. Position the brush so that your cursor is at the bottom of the screen.
- Press `Shift-7` to rotate the brush on the X axis.
- Choose **Perspective>FillScreen** from the Effect menu and watch as DeluxePaint fills the perspective plane with a pattern of your brush.

The results of this last step should look something like Figure 5.12.

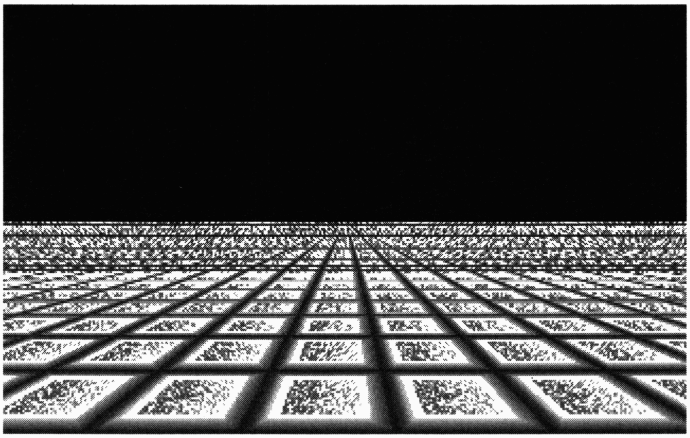


Figure 5.12 Perspective plane painted using Perspective>FillScreen

As we said, you can set your perspective plane at almost any angle to the Perspective Center. In the next step, we'll draw a plane to the right of center with the brush rotated sideways. This will create a "wall" on the right.

- Press `0` to reset your brush to it's original orientation. Place the brush in the lower right corner of the screen.
- Press `Shift-4` to turn the brush into the screen.
- Choose **Perspective>FillScreen** from the Effect menu.

Practice creating different planes. For example, position the brush above perspective center to create a "ceiling" from your brush.

The Perspective Horizon

The position of perspective center plays an important role in determining the angle of the plane to the viewer. It also determines the horizon point. The horizon point is the farthest edge of the plane when you rotate a brush to 90°. To demonstrate how this works, we'll load a picture that has a horizon, and fill the plane out to the horizon.

- ▶ Load the picture Seascape from the Art1 disk and choose **Palette>Default Palette** from the Color menu.

You might remember this picture from the Guided Tour. In the picture, the ocean stretches to a flat horizon on the right side. We'll set our Perspective Center in line with this horizon and then fill a perspective plane.

- ▶ Choose **Perspective>Center** from the Effect menu. Your cursor changes to a large cross hair.
- ▶ Position the cross hair so that it is half way across the screen and so the horizontal line of the cross hair lines up with exactly the horizon in the picture. Click to place the perspective center.
- ▶ Now, load your Blockbrush brush, and enter Perspective mode.
- ▶ Press `Shift-7` to rotate your brush -90°.
- ▶ Choose **Perspective>FillScreen** from the Effect menu to fill the perspective plane.

When you are finished, your screen should look like Figure 5.13. Notice that the horizon of your perspective plane exactly matches the horizon of the original picture.

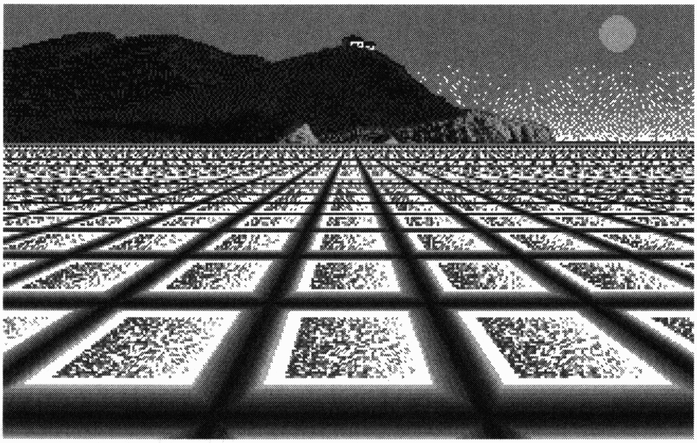


Figure 5.13 Seascape with a perspective plane added

The Angle of the Plane

In the example above, the perspective plane matches the horizon because you rotated the brush by 90°. If you had rotated by more than 90° the plane would not reach the horizon, as though the plane sloped downward. If you had rotated by less than 90°, the plane would extend above the horizon, as though it sloped upward like a mountain. It is difficult to see the differences unless you have an existing horizon to compare the plane with. Without an existing horizon, the sloping of the plane will appear to be only a difference in the distance between the position of the brush and the perspective center when the brush was rotated.

When you create a perspective plane, the position and angle of the plane are determined by three things:

- ☐ the position of the Perspective Center;
- ☐ the position of the brush handle (cursor) when you rotate the brush;
- ☐ and the degree of rotation.

In our examples above, we rotated the brush in 90° increments so the plane was always either parallel to our point of view or at a right angle. If you want to create a sloping surface, you do so by rotating the brush to an angle less than 90°. Here's a quick example.

- ▶ Choose **Perspective>Reset** from the Effect menu.
- ▶ Position your brush so that the cursor is at the very bottom of the screen. Hold down `7` on the keypad until the brush has rotated -60° on the X axis.
- ▶ Move the mouse forward and backward to see how the brush moves on this new plane.

You'll notice that the vanishing point of the brush is above the horizon in your picture, this is because the plane is not parallel to the point of view. It is as though you were looking at a gradual incline.

Putting Things in Perspective

We've covered the fundamentals of perspective. Now it's time to put what you've learned into practice. In this exercise, we'll create a perspective landscape and build a three dimensional arch as shown in Figure 5.14. In the process, you'll learn some of the tricks about using perspective that you can understand only when you see them in context.

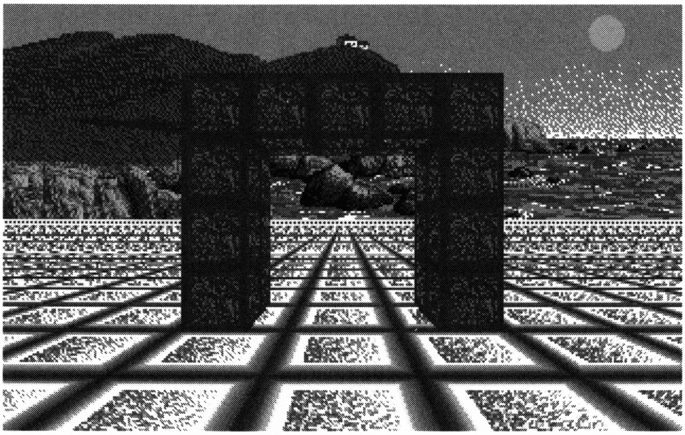


Figure 5.14 Seascape with Arch

Creating the Plane

The first step of our tutorial is to create a perspective plane. You don't need to create a plane every time you use perspective. We're doing it here, so you can readily see the "depth" of your picture.

▶ Load the Block brush from the Art1 disk.

Notice that this brush is held by the lower right corner. If you expect to use a brush in Perspective, it is best to save the brush with the handle in the lower right corner for two reasons:

1. Rotations always occur around the handle, so holding the brush in the corner helps make the rotations consistent and useful.
2. If you establish a Perspective grid, you can make all of your brushes conform to that grid if their handles are in the same corner.

▶ Choose **Coords** (short for Coordinates) from the Prefs menu.

▶ Press the Enter key to enter Perspective mode.

▶ Position the cursor at 196, 25 and press `G`, which turns on the grid and uses 196, 25 as one of the grid points.

❖ If you turn on Coordinates and take note of the cursor position before you rotate your brush, you'll be able to recreate the perspective plane exactly.

▶ Press `Shift-7` to rotate the brush -90° on X.

Notice that at this point you don't have angles in your Title Bar. You can turn off Coordinates if you want to see the angles, but you don't need them for this exercise, since all of our movements are on 90° and based on sight, not numbers.

- ▶ Choose **Perspective>FillScreen** from the Effect menu.

Building the Arch

- ▶ Load the RedBlock brush.

At this point you are no longer in Perspective mode, but the Grid is still on.

- ▶ Press the Enter key to enter Perspective mode.

Your brush is automatically laid down on the perspective plane in the same orientation you left it in last (that is, rotated -90° on the X axis). This is an important point to remember, because it means that you can easily bring in new brushes at the right perspective simply by loading them with the perspective plane defined by the previous brush.

❖ You'll notice that the grid has been adjusted to your new brush size. It is not necessarily true that your new brush will line up correctly with the grid point you used to define the plane (196, 25), because the brush handle is tied to the closest grid point when you enter perspective, and there is a three-in-four chance that it will be tied to one of the other corners. If you want the brush to line up with the grid point you specified when you created the grid, press `0` to reset the brush to 0, 0, 0 orientation, align the handle with the grid point, and rotate the brush again.

If you don't want your perspective grid automatically sized to new brushes, turn off the **AutoGrid** option in the Prefs menu.

- ▶ Press `G` to turn off the Grid so you can move the brush freely on the plane.
- ▶ Position the brush so that the Y axis of the brush is aligned with the Perspective Center and the bottom of the brush is aligned with the edge of the second full row of tile on the floor. (The coordinates will show this point as 175, 46.)
- ▶ Press `G` to turn on the grid and use your new handle position as one of the grid points.
- ▶ Press `Shift-8` to rotate the brush up on the X axis. Move the brush two grid points to the left and stamp it down. Paint the

brush three times above the current brush position so you create the face of a column.

- Paint the brush four times to the right to form the top of the arch and the top of the right column. Then paint the brush three times down to form the right column.

At this point you have a two dimensional arch on a three dimensional plane. Our next task is to give the arch a third dimension.

- Move the brush so that it is directly on the bottom block of the left column of your arch. Press `Shift-4` to rotate the brush 90° on the y axis. Paint the brush where it is and twice above to form the left side of the column.
- Move the mouse a bit to the right to move the brush back along its x axis and paint another set of blocks so your column is one block wide at the face and two blocks deep as shown in Figure 5.14.
- Press `Shift-5` to rotate the brush back on its Y axis so that it is facing you head on. If the brush is not the same size as the facing blocks of your arch, hold down the Ctrl key and move the mouse forward or backward to bring it closer or move it back.
- ❖ Remember, the Ctrl key temporarily fixes the Y axis of your brush so that you can move it on it's Z axis. As you become adept at painting in Perspective, you'll find yourself using this key often.
- Position the brush to the left of the bottom block of the right column. Press `Alt-x` to change the brush handle to the other side of the brush.

Your brush jumps so that it is over the bottom block of the right column, but the brush is now held by the lower left corner. Remember that Alt-x, Alt-y, and Alt-s reposition your brush handle. These keyboard equivalents are especially useful while working in Perspective, since you usually don't want to move your mouse to choose from a menu.

- Press `Shift-5` to rotate the brush 90° on the Y axis. Paint the brush where it is and twice above to form the left side of the column. Paint another column just behind this first one so your column is one block wide at the face and two blocks deep.
- Press `Shift-4` to rotate the brush back on the Y axis. If the brush is not the same size as the facing blocks of your arch, hold down the Ctrl key and move the mouse forward or backward to bring it closer or move it back.

- Move the brush up so that it is over the block in the upper left corner of the arch. Press `Shift-7` to rotate the brush -90° on the X axis. Move the brush to the right and stamp it once below each of the three blocks that form the top of the arch. Paint another row just behind this first row so the top of your arch is one block high and two blocks deep.

Now your arch is complete and should look just like the arch in Figure 5.14.

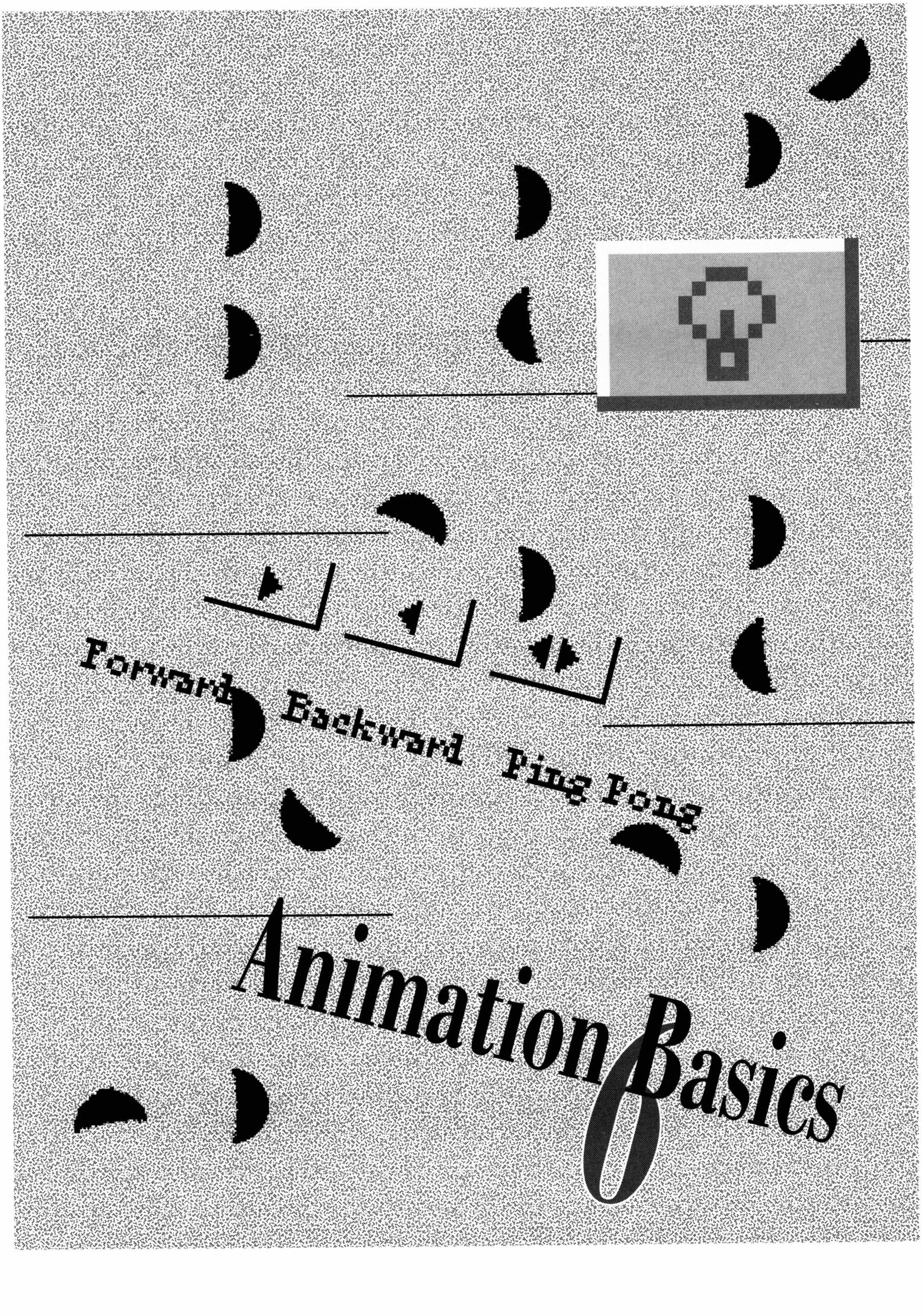
Inserting the Seascape Picture

To give your perspective painting a bit more color, and a landscape for the background, we'll load the Seascape picture and add it behind the arch.

- Choose **Spare>Swap** from the Picture menu to display the spare page
- Load the Seascape picture from the Picture drawer on your Art1 disk. Choose **Palette>Default Palette** from the Color menu.
- Jump back to your main page (press j or choose **Spare>Swap** from the Picture menu).
- Choose **Spare>Merge in back** from the Picture menu.

In a flash, your arch has a nice seascape backdrop.

This exercise gave you a quick example of perspective, but you can do a lot more. For an excellent example of perspective at work, load the picture Hall-of-Stars on your Art1 disk.


Forward
Backward
Ping Pong

6

Animation Basics

Chapter 6: Animation Basics

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This chapter introduces you to DeluxePaint IV's animation features. It begins by explaining the basic model for animation and then covers each of the different ways to create animations with the program. We recommend that you work through this chapter in one sitting. It will take you approximately 45 minutes to complete.

Before You Begin

If you've been experimenting with DeluxePaint for a while before starting this chapter, it would be a good idea to quit the program and restart. If you start the program fresh, there is less chance that the results you get from following our instructions will be different from what we describe.

▶ When the Choose Screen Format requester appears, click Ok to use the default settings (Lo-Res, 320x200, and 32 colors).

❖ If your computer has only 1 MB of RAM, we recommend that you load the program in Swap mode.

The Basic Model

The basic idea behind animation in DeluxePaint is that instead of having a single page to paint on, you have multiple pages that you can paint on and flip through. By creating images that differ slightly from page to page and then playing them back in rapid succession, you create the illusion of motion.

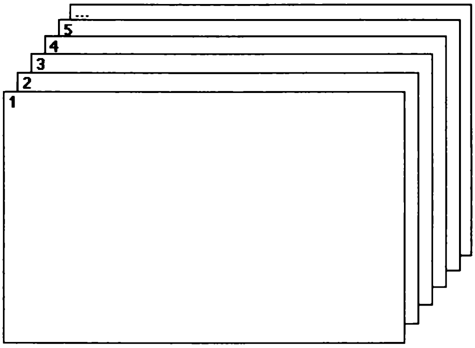


Figure 6.1 The Basic Model

This section shows you how to:

☐ create frames for your animation

☐ paint on individual frames in the animation

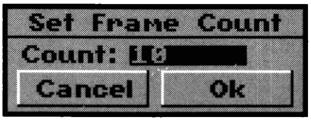
☐ paint while the frames are flipping—this is called Animpainting™.

☐ use the Animation Control Panel

Creating Frames

The first step in building an animation is to create the frames to paint on.

▶ Choose **Frames>Set #** from the Anim menu. The Set Frame Count requester appears.



Count: 10

Figure 6.2
The Set Frame Count requester

▶ Click in the Count edit box, change the frame count to 10 and click Ok.

You now have 10 frames to paint on. Notice the numbers 1/10 at the left side of the Title Bar. This means you are positioned on the first frame of a 10 frame animation.

Painting One Frame at a Time

The most basic way to create an animation is to paint on each successive frame individually.

▶ Select the largest round built-in brush and paint a dot in the upper left area of your screen.

The dot you just placed is on frame 1. The trick of animation in DeluxePaint is to paint a slightly different picture on successive frames. So you need to move to the next frame.

▶ Choose **Control>Next** from the Anim menu to move to frame 2. (Notice the Title Bar shows 2/10.) Click another dot to the right of where your first dot was.

Now you have a dot on frame 1 and a dot on frame 2. To create a series of dots that move across the screen, you just repeat the last step. You'll notice that changing frames from the menu is a little cumbersome, and it forces you to move the mouse from the painting area. It's much more efficient to move through the animation frames by using the keyboard equivalents (listed in the menu beside the options). Follow the numbered steps below and we'll use keyboard equivalents to complete and play our little animation.

1. Position your brush just to the right of the dot you painted on frame 2.
2. Press 2 on the keyboard once, then click to paint a new dot.

3. Repeat step 2, painting each dot to the right of the previous one, until your first dot appears again in the left side of the screen. (The Title Bar will show 1/10 as your frame position.)

   You've just created a brief animation. Now let's play it.

4. Choose **Control>Play** from the Anim menu (or press `4` at the top of the keyboard). You should see your dot moving from left to right across the screen.

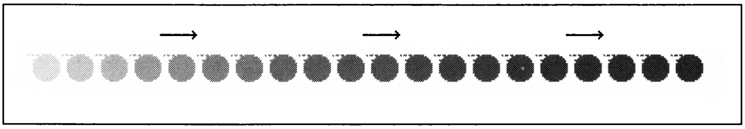


Figure 6.3 A simple dot animation

5. To stop the animation, press the *space bar.*

Animation Control Panel

Selecting animation options from the Anim menu or using keyboard equivalents for those commands are only two of the ways DeluxePaint has for controlling your animations. Those two methods are handy, but perhaps the most efficient way to control your animation is through the Animation Control Panel.

▶ Select **Control>Panel On** from the Anim menu.

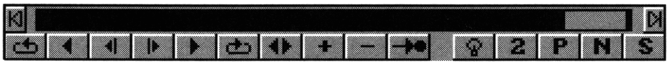


Figure 6. 4 Anim Control Panel

The Animation Control Panel appears at the bottom of the screen. It's useful to have it visible while you work on your animation sequence. If you want to remove it while you're animating, choose **Control>Panel Off** from the Anim menu.

The Control Panel presents Frame slider and scroll arrows, and fifteen control buttons for working through and playing with your animation.

Frame Slider

The Frame slider helps you keep track of where you are in your animation sequence, when you've hidden the Title Bar. Even when the Title Bar is showing you can move to a specific frame by dragging the slider or by clicking on it. One click moves the animation one frame. Clicking on the scroll arrows will take you to the first (left-arrow) or last (right-arrow) frame.

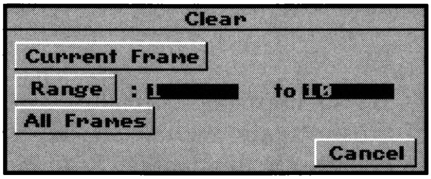
Anim Control Buttons

Play Backward Continuously	■	Play your animation sequence in a continuous loop, from last frame to first frame. Press the *space bar* or click to stop play.
Play Backward Once	■	Click to play through your animation sequence one time, from the last frame to frame 1. Animation ends on the first frame.
Previous Frame	■	Click to move backward one frame. Steps from the current frame to the previous frame in the animation sequence. If the current frame is the first frame in the sequence, the position is set to the last frame.
Next Frame	■	Click to move forward one frame. Steps the current frame to the next frame in the animation sequence. If the current frame is the last frame in the sequence, the position is set to the first frame.
Play Forward Once	■	Click to play through your animation sequence one time, from Frame 1 to the last frame. Animation ends on the last frame.
Play Forward Continuously	■	Play your animation sequence in a continuous loop, from first frame to last frame. Press the *space bar* or click to stop play.
Play Ping-Pong	■	Plays your animation sequence continuously as above, but plays the sequence forward then backward then forward and so on. Press the *space bar* or click to stop play.
Add a Frame	■	Adds a frame after the current frame, and copies the contents of the current frame to it.
Delete a Frame	■	Deletes the current frame and makes the following frame the current frame (unless you're already at the last frame). You can't UNDO a delete command, so DeluxePaint asks you to confirm that you really want to delete a frame.
Go To Frame	■	Takes you to the frame specified in the Go To Frame requester. Holding down the Ctrl key when clicking this icon brings up the Go To Frame requester.
	■	❖ The LightTable and the four associated icons on the right side of the Control Panel will be described later in this chapter.

Painting with Animation

You saw above that one way to create an animation in DeluxePaint is to paint on a series of frames individually. For creating animations that involve simple movement of an object, DeluxePaint provides a much easier method called animpainting. Essentially, the frames flip automatically while you paint.

- ▶ Click CLR in the Toolbox. The Clear requester appears.



Range : 1 to 10

Figure 6.5 Clear requester

When you click CLR with multiple frames, DeluxePaint gives you the option of clearing only the current frame, a range of frames in your animation, or all frames

- ▶ Click All Frames in the requester.

In a moment all of your frames are cleared and you are automatically set back at frame 1. Now let's do some animpainting.

- ▶ Select the large round brush, and the Dotted Freehand tool.
- ▶ Hold down the Alt key, and paint by holding down the left mouse button and dragging across the screen from left to right.

As you paint, the frames flip automatically, so you place only one dot on each frame of your animation. Notice that the frame counter in the Title Bar changes to show what frame you are on. When you reach the last frame, you loop back to frame 1, where you'll see your first dot again.

The **Alt** key is your animpainting key. If you hold down the Alt key at the time you press the mouse button down, the animation frames will flip with each stamp of the brush so that you stamp only once on each frame. Remember that you only need to hold down the Alt key as you press the mouse button down. Then you can release Alt to press other keys if you need to.

- ▶ After you have painted for a few seconds, stop and choose **Control>Play** from the Anim menu or press 4 on the keyboard.

You can also use the Animation Control Panel to activate any of the commands that are called for in this chapter.

▶ Press the *space bar* or click to stop the animation.

Now you know these basic elements of animation:

☐ How to create frames.

☐ How to move through the frames one by one and paint.

☐ How to animpaint.

Animpainting is especially powerful if you have an animated brush to paint with; we'll show you how to create and use one later in this chapter. Right now we want to show you more ways to move objects on the screen.

Automatic Animation Using the Move Requester

The Move requester lets you automatically move and rotate a brush over a number of animation frames. More importantly, you can move and rotate the brush in all three dimensions. In essence, you are painting using Perspective, but DeluxePaint makes all of the calculations for the individual frames.

This section will take you through a detailed explanation of each feature of the Move requester and give examples for most of the features.

▶ To begin, click CLR and clear All Frames from the previous animation sequence.

▶ Choose **Frames>Set #** from the Anim menu. Change the frame count to 20, and click OK.

▶ Press `Shift-1` to move to frame 1.

▶ Load the brush DPaintTitle from the Brush drawer of the Art1 disk.

▶ Choose **Palette>Use Brush Palette** from the Color menu.

❖ These instructions assume that your memory method (**Method** in the Anim menu) is set to Compressed—the default setting. Amigas with one megabyte of RAM can create only 9 to 10 frames using the Expanded method. You'll find a brief description of the two memory methods in ***Reference***.

Simple Moves in Three Dimensions

The Move requester does exactly what its name implies—it moves your brush on the screen. There are many impressive animations you can create with only the Move requester and a brush like our DPaint IV brush, but to create those impressive animations, you need to know how each feature of the Move requester works. This brief section explains the most basic Moves.

- ▶ Stamp your brush in the center of the screen.
- ▶ Choose **Move** from the Anim menu. The Move requester appears.

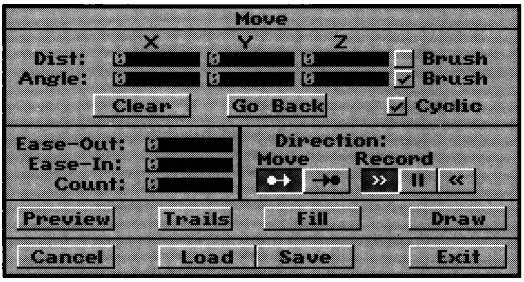

Move
X
Y
Z
Dist:
0
0
0
☐ Brush
Angle:
0
0
0
☑ Brush
Clear
Go Back
☑ Cyclic
Ease-Out:
0
Ease-In:
0
Count:
0
Direction:
Move
Record
»
II
«
Preview
Trails
Fill
Draw
Cancel
Load
Save
Exit

Figure 6.6 The Move requester

The first row in the Move requester lists the three axes (X, Y, and Z) in the three dimensional space of your screen. If you are familiar with Perspective you know that these axes run left and right, up and down, and in and out from the screen respectively. Figure 6.7 shows the orientation of the three axes to the screen.

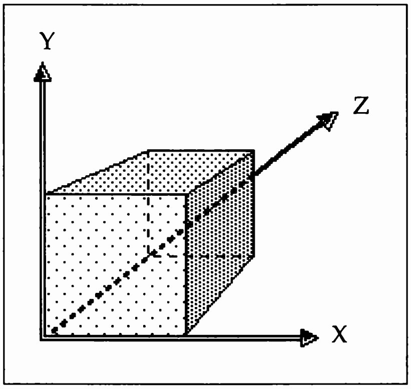


Figure 6.7
The three axes

Directly below the X, Y, Z letters there are edit boxes for entering Distance (Dist:) numbers. You enter numbers here to tell DeluxePaint how far to move your brush in any direction or combination of directions. (If your brush is moving only on the X and Y axes, the numbers are equal to pixels, but once you move along the Z axis, the units are either smaller or larger than pixels.) Let's look at a simple example:

- ▶ Click in the Dist edit box below X and set the number to 200.
- ▶ Make sure that the Count edit box (in the middle of the requester) shows 20 as the current setting. If the number is not 20, click in the edit box and change the number.
- ▶ Click Preview to see a preview of the movement of your brush.

You will see your brush enclosed in a wire frame move to the right across the screen. If you want your brush to move to the left, you enter a negative number for the X Distance. Try it.

- ▶ Set the X Dist edit box to -200. Click Preview.

This time your brush moves to the left across the screen. A similar rule applies to the other two axes: Y Distance moves your brush upward if the number is positive and downward if the number is negative. Z Distance moves your brush out to the distance (away from you) if the number is positive or inward to the screen (coming toward you) if the number is negative.

You can use any combination of the three Dist edit boxes to move your brush anywhere in three dimensional space. Try it if you like. Set a number for each of the three boxes and click Preview to see where the brush would move.

Simple Rotation

In addition to moving the brush along an axis or several axes in combination, the Move requester lets you rotate the brush around one or more axes. You rotate the brush by entering numbers in the Angle edit boxes.

- ▶ In the Move requester, click Clear, which clears all data from the Distance and Angle edit boxes.
- ▶ Click in the Z Angle edit box and enter 360 as the angle of rotation. (This tells DeluxePaint that you want to rotate the brush 360° on the Z axis.) Click Preview.

You'll see a wire frame representation of your brush rotate clockwise on the screen. Just as negative numbers change the direction of movement when using Distance moves, negative numbers change the direction of rotation when you use Angle moves.

- ▶ Change the Z Angle setting to -360° and click Preview.

The wire frame rotates counter-clockwise.

Brush Check Boxes

At this point you may be wondering about those two options labeled Brush beside the Distance and Angle edit boxes. The short answer is that these options determine whether your brush moves and rotates based on the screen axes or based on the brush axes. The default setting is for the brush to move along the screen axes and to rotate around the brush axes. To fully understand this feature, you'll need to be familiar with how Perspective, described in Chapter Five, works. We'll explain the Brush check boxes in more detail later in this chapter. For now, just leave them as they are.

The Go Back Command

The Go Back button has a similar function to the Clear button, only it affects the location of the brush rather than the settings in the Move requester. When you use the Move requester to move your brush in three dimensional space, DeluxePaint remembers the *ending* position of the brush when the move is complete. If you want to do a second move from the original brush position, click Go Back to reset the brush location.

We'll show you the results of two different move paths, one without using Go Back and one using Go Back. In this example you'll also actually draw and play the animation instead of simply previewing it.

Successive Moves without Go Back

- Click Cancel in the Move requester. Click CLR and clear all frames.
- Position the brush at the bottom of the screen, and paint it down.
- Choose **Move** from the Anim menu to display the Move requester.
- Click Clear to clear the edit boxes and then set the Y Distance to 200 and the Z Distance to 400.
- Click Draw.

You just created the first part of the brush's movement. Now we'll create the second part to continue from where the brush ended.

- Instead of choosing **Move** again, this time press `M` to display the Move requester. M is the keyboard equivalent of choosing **Move** from the Anim menu.
- Set the X Distance to 800, leave the Y distance at 200, and set the Z distance to 0. Click Draw.

- ▶ Choose **Control>Play** from the Anim menu and watch your animation. Press *space bar* when you've seen it enough.

In the animation you created, your brush moves into the distance and upward and then shoots off the screen diagonally to the right. Because you didn't use the Go Back button, the second part of the brush's movement follows directly from the end of the first part.

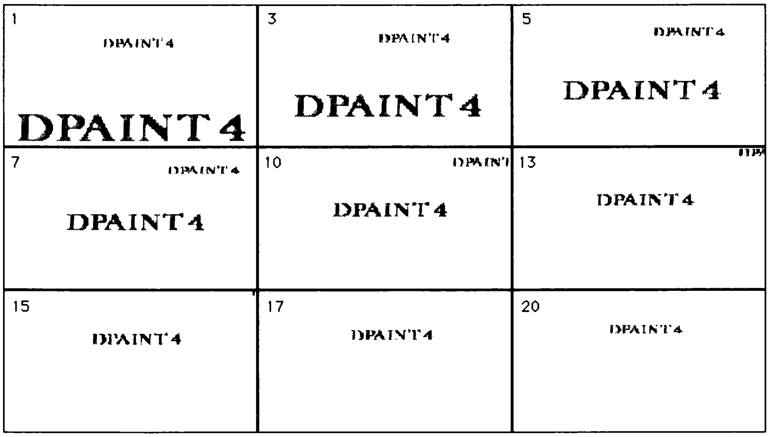


Figure 6. 8 Results of two successive moves without Go Back

Successive Moves with Go Back

In the next set of steps, you'll use the same settings as the first example, but you'll also click the Go Back button before drawing the second part of the brush movement.

- ▶ Click CLR and clear all frames. Position the brush at the bottom of the screen, and paint it down.
- ▶ Press `M` to display the Move requester. Set the X Distance to 0, the Y Distance to 200, and the Z Distance to 400. Click Draw.
- ▶ Press `M` again. Set the X Distance to 800, leave the Y distance at 200, and set the Z distance to 0. Click the Go Back button. Click Draw.
- ▶ When DeluxePaint is finished drawing the animation, choose **Control>Play** from the Anim menu and watch your animation.

This time you see your animation shows a title splitting into two, with one title moving into the distance and upward and the other moving diagonally off the screen to the right.

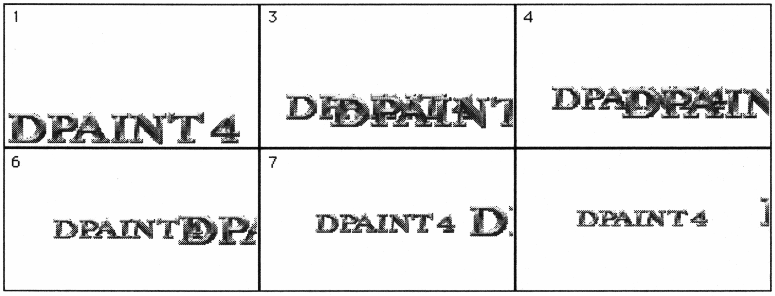


Figure 6. 9 Results of two successive moves with Go Back

Cyclic and Non-Cyclic Moves

You use the Cyclic button to tell DeluxePaint which of two kinds of animation you want:

- □ an animation that will loop back on itself (cycle) or chain from the current move to another move of a similar type; or
- □ an animation that is linear and will end at the last frame you requested in the Move requester.

DeluxePaint draws your move differently depending on whether or not the Cyclic button is selected. In this section we'll give you a very quick example of the difference between the two moves.

Cyclic Animation

For purposes of this exercise, the number of frames in your animation should be 20.

- ▶ Load any brush that contains features to help you tell whether or not the brush has been rotated. (The DPaintTitle brush will do very well.)
- ▶ Click CLR and clear all frames. Stamp the brush in the upper half of the screen.
- ▶ Display the Move requester. Click Clear in the requester. Set the Z Angle to 360.
- ▶ Click the Cyclic button so a √ appears in the box. Click Draw.

When DeluxePaint is finished drawing your animation, notice that you are on frame 1 of your animation. DeluxePaint moved you to the frame past the ending frame of your Count.

- ▶ Press `Shift-2` to go to the last frame of the animation. (20/20 appears in Title Bar.)

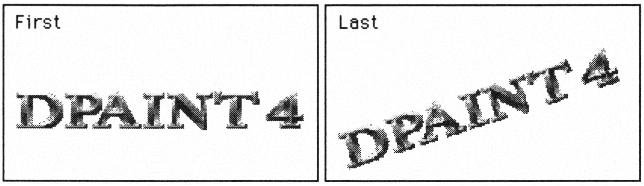


Figure 6.10 First and last frames of a cyclic 360° rotation

Notice that on the last frame of your animation, the brush is not rotated 360°, even though you asked for a 360 rotation in the Move requester. This is because Cyclic tells DeluxePaint to create a "cyclical" animation—one that completes the move on the same frame where it began. With this animation, you can play continuously without a seam.

- Press `4` and watch the animation for a moment. Press the *space bar* to stop the animation.

Non-Cyclic Animation

If DeluxePaint had painted the brush fully rotated on the last frame, you would have the same image on frames 1 and 20, and the animation would hiccup when you played it continuously. Let's draw the same thing with Cyclic turned off to see how that works.

- Press `Shift-1` to move to frame 1 of your animation. Paint your brush in the lower half of the screen.
- Display the Move requester. Click Cyclic to turn it off (remove the √), and click Draw.

Even as the new move is being drawn you can see that the new rotation is in larger steps than the first one. When the draw is complete, you will be left at frame 20, where you can see that the new move completed the 360° rotation on frame 20, *unlike the Cyclic move which left you on frame 1.*

- Press `4` and watch the animation. Press the *space bar* to stop the animation.

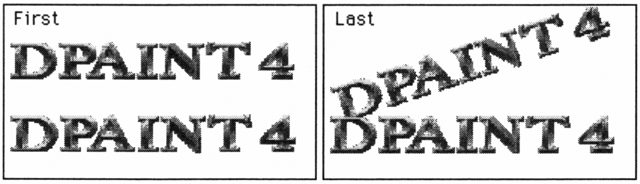


Figure 6.11 First and last frames of cyclic (above) and non-cyclic 360° rotations

You should be able to see that the rotation at the top of the screen is smooth, but the rotation at the bottom of the screen hiccups noticeably.

You might ask yourself at this point why anyone would want Cyclic turned off. The answer is simple: you might want to rotate exactly 90° by a particular frame or you might want to move an object from point A to exactly point B. Generally, if you are creating an animation sequence that runs for less than the full number of frames you have allocated for your animation, you don't want Cyclic turned on. For a clear example of why you would want Cyclic turned off, follow the next set of steps.

- ▶ Clear all frames of your animation. Press `Shift-2` to move to the last frame.
- ▶ Select the Unfilled Circle tool and the single-pixel brush and draw a small circle on the right side of the screen.
- ▶ Choose **Coordinates** from the Prefs menu to turn on Coordinates.
- ▶ Select the Dotted Freehand tool and the largest round built-in brush. Position the brush in the middle of your unfilled circle and note what the Coordinates show as the location of the brush.
- ▶ Move the brush 200 pixels to the left of that position, press Shift-1 to move to frame 1 and stamp down your brush.

Tip When you need to move your brush in a straight line horizontally or vertically as you did in the step above, hold down the Shift key. This constrains your cursor to horizontal or vertical movement, depending on which direction you move in first.

- ▶ Display the Move requester, click Clear, set the X Distance to 200, make sure Cyclic is selected, and click Draw.

When DeluxePaint finishes drawing the animation, notice that you are left on frame 1. Now look at frame 20 (press `Shift-2`). You'll see that even though the distance from where you stamped your brush to the center of the circle was exactly 200 pixels and the move you requested was 200, the dot did not reach the center of the circle. If you want to move your brush to a specific location by your ending frame, turn Cyclic off.

Figure 6.12 shows the results of the steps above with Cyclic selected and not selected.

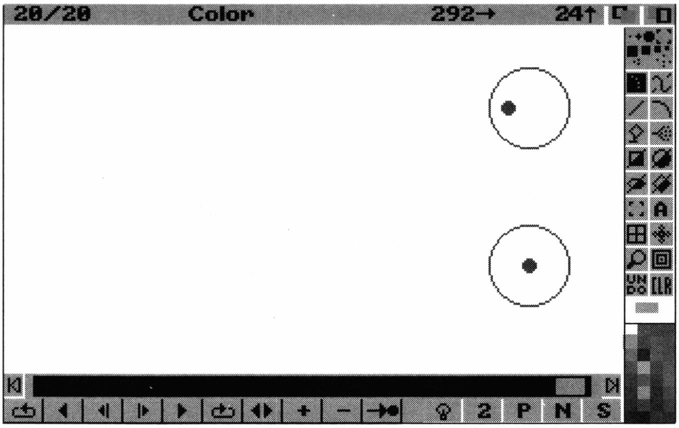


Figure 6.12 Example of linear move with and without Cyclic selected

Although you can't see it, DeluxePaint has positioned the brush in the center of the circle on frame 1. If you want to prove this. Go to frame 20, display the Move requester, click Clear, change the Count to 1 and click Draw.

When you complete a move with Cyclic selected, DeluxePaint automatically advances you to the frame beyond the end of your Count and the brush position DeluxePaint remembers is the position you specified in the Move requester.

Smooth Moves with Ease

The Ease Out and Ease In edit boxes let you specify a number of frames over which the brush can accelerate or decelerate in your animation. The primary advantage of these features is that you can make the brush movement smooth at its beginning and ending points. Also, some effects require a gradual acceleration and deceleration to be realistic. For example, a bouncing ball should accelerate on the way down. The bouncing ball is a good example of how this feature works, so let's try it. In the process we'll also use the Come To option under Direction: Move in the Move requester.

- ▶ Clear all of your frames. Draw a filled circle about the size of a nickel.
- ▶ Press `b` to select and activate the Brush Selector tool.
- ▶ Use the right mouse button to pick up the "nickel" as a brush.
- ▶ Move to frame 20 and stamp the brush down near the bottom of the screen.

- ▶ Display the Move requester; click Clear; enter -170 for your Y Distance move. Change the Ease Out edit box to 10. Select the Come To option. Make sure the Count is set to 20. Click Draw.
- ▶ After the animation is drawn, choose **Control>Ping-pong** from the Anim menu to play the animation forward and backward. What you should see is a bouncing ball.

Let's take a moment to review what you just did. When you entered -170 for your Y move, you told DeluxePaint that you wanted the brush to move downward 170 pixels. When you entered 10 in the Ease Out edit box, you told DeluxePaint that the brush should gradually increase its speed over the first 10 frames and then move at the same speed for the last ten. Finally, by clicking the Come To option, you told DeluxePaint that the brush movement should end in the position and on the frame where you clicked. We'll find a detailed explanation of this option in the next example.

More on the Move Requester

What remains in the Move requester is fairly straightforward. For now, we'll summarize what each of the buttons does. You'll find additional explanations and more examples of the features below, in the following chapter, and in ***Reference***.

Direction

The Direction options control the direction of the move and the direction of the recording.

The Go From button is the default setting for movement. With this option selected, the settings in the Move requester are used to paint motion away from the point where you stamped your brush. For example, an X Distance of 200 moves to the right *from* where you stamped your brush, over the number of frames set in the Count edit box.

With the Come To option selected, the settings in the Move requester are used to paint motion toward the point where you stamped your brush. For example, an X Distance of 200 moves to the right *to* where you stamped your brush. This option is most useful when it's easier to specify the position where you want the move to end than it is to specify the beginning. Remember that you want to stamp the brush on the frame you want your animated move to end on. Here's a practical example.

Assembling the Pieces

Suppose you want pieces of a picture to fly onto the screen and assemble neatly on the last frame. If the pieces are coming from off screen, it's difficult to position the brush there for the beginning of the move! And you don't want to calculate backwards from the ending position to figure out just where the starting position should be anyway. The answer is to go to the last frame, paint down your brush, and tell DeluxePaint to paint the brush moving toward this point. That's what the Come To option is all about. Let's do it.

- Clear all frames.
- Choose **Frames>Set #** from the Anim menu and set the number of frames to 20.
- Press `Shift-2` to go to the last frame of the animation.

Remember, when you use the Come To option, you always paint the brush down on the frame where you want the move to end.

- Choose **Load** from the Brush menu. Load the file named pie1.brush from the Art1 disk. Choose **Palette>Use Brush Palette** from the Color menu.
- Paint the brush down in approximately the middle of the screen.
- Display the Move requester, and click Clear.
- Set the X distance to -200. Set the Y distance to -150. Set the Z angle to 180. Click the Come To option.
- Ease out should be set to 0. Set Ease In to 5, and click Draw.
- Play the anim that you have so far. If you wish to adjust the speed at which the anim plays, choose **Control>Set Rate** from the Anim menu.

You'll see the piece of pie chart fly in from off the screen. Notice how the Ease In setting of 5 frames smoothed the landing of the pie. If you continue with the other two pieces to construct the full pie chart, you'll see that this Ease In element is very important to the look of the animation.

If you get the point of this exercise and don't want to complete the flying pie chart, you can continue on. Otherwise, (or if you want to continue for fun) there are two more pieces of pie chart to load. Load each one and stamp it in place (with the black edges of the slices overlapping) and set any move you want that will send the slices flying onto the screen.

This is a great opportunity to experiment with the Move requester settings; no matter what numbers you enter, the pie will come to the proper end point on frame 20.

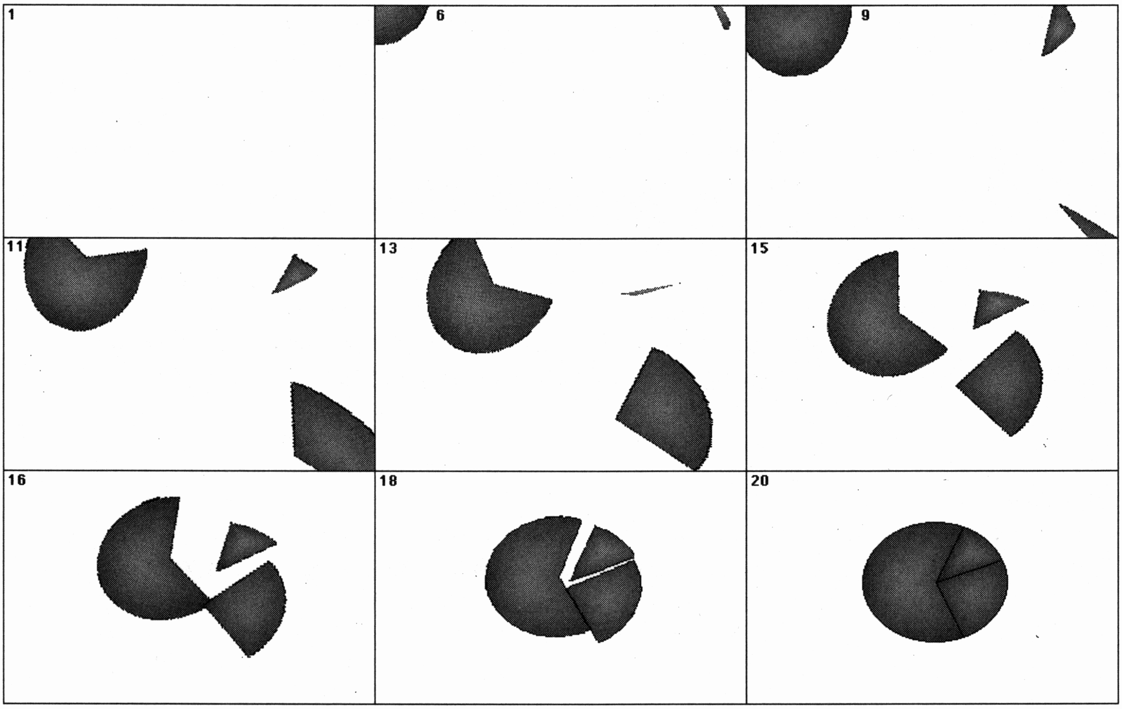


Figure 6.13 Flying pie chart using Come To and Ease In

Record » II « The Record options let you specify the direction in which DeluxePaint paints the frames of your move.

» Forward is the default and paints the frames by flipping forward.

II In Place causes DeluxePaint to paint all of the move on the current frame.

« Backward paints the frames by flipping backward — this option is useful with Trails.

Trails and Fill are best explained by vivid example, you'll find two examples of each in the next chapter.

Load Displays the Load Move requester. From here you can load Move settings that you entered and saved with the Save Move requester. When you load a move, you are loading only the settings for the Move requester. You still need to stamp your brush in the correct position and on the correct frame to duplicate the move you had in mind. If you aren't absolutely sure of the setting you want to load, try using the feature this way: stamp your brush in the center of the screen; load the move settings you think you want; click Preview to see the move as it would look if it started from the middle of the screen. This will give you a good idea of what the move looks like when it is actually drawn, and it will also help you determine where your brush should be stamped to produce the best move for these settings. The requester works just like the Load Picture requester.

Save

Displays the Save Move requester. DeluxePaint lets you save the settings (though not the images) of any move you set up in the Move requester. You can load a saved settings and use them as a kind of template to automatically describe the movement of another object. The requester works just like the Save Picture requester.

Animated Brushes

So far we've shown you how to create an animation by painting on a series of frames. DeluxePaint also lets you select an area of animation as a brush and paint with it. The result is that the brush changes while you paint, and, depending on whether or not the frame changes, you create either animation or interesting effects.

In ***Guided Tour (2)***, we showed you how to load and use one of the AnimBrushes included on the Art2 disk. In this section, we'll show you how to create a simple AnimBrush of your own and paint with it.

Creating an AnimBrush

To begin, let's create a simple animation that we can easily pick up as a brush.

- Choose **Palette>Default Palette** from the Color menu.
- Clear all of your animation frames. Paint a circle about the size of a quarter and filled with a gradient. Pick your sphere up as a brush.
- Paint your brush down and rotate it 360° over twenty frames. To do this:
- Display the Move requester. Click Clear to set all of the options to their defaults. Set the Z Angle to 360 and select Brush angle. Select Cyclic and make sure the Count is 20.
- Make sure Ease In and Ease Out are set to 0.
- Click Draw.

Your brush will rotate in place to create an animation that looks a little like a spinning planet.

Picking Up an AnimBrush

- ▶ When DeluxePaint is finished painting the animation, step to frame 1 and choose **AnimBrush>Pick Up** from the Anim menu.

A large cross-hair like the one you use to pick up standard brushes appears, but it is special in that it picks up from a series of frames.

- ▶ Pick up the sphere animation as a brush as you normally would using the left mouse button.
- ▶ In the Pick up AnimBrush requester that appears, 20 should appear in the Number of Cels edit box. If it does, click Ok.

After you click Ok, you will see each of the frames flip as the area is picked up. When it's done, you have your AnimBrush. Another way to pick up an AnimBrush is to select the Brush Selector and hold down the *Alt* key as you pick up an area of your animation.

Painting with the AnimBrush

- ▶ To prove that you have an animated brush, paint with it a little.

You'll see that the brush spins as you paint. This is one way to use an animated brush. But better yet, try animpainting:

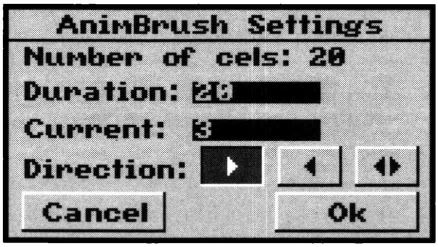
- ▶ Click CLR and clear all frames. Hold down the *Alt* key. Position the brush in the lower left corner of the screen and paint from left to right across the screen.

The frames flip as you paint, so you only place one cel of the AnimBrush on each frame of your animation. When you play the animation back, you'll see a ball roll from left to right across the screen.

AnimBrush Settings

When you begin to combine AnimBrushes into large animations, you'll find that occasionally you want to change the rate at which an AnimBrush transforms. You might even want to change the direction in which an AnimBrush plays. For example, you might want the gradient ball you created above to turn in the opposite direction. You can do this with the AnimBrush Settings requester.

- Choose **AnimBrush>Settings** from the Anim menu.



Number of cels: 20
Duration: 20
Current: 3
Direction: ▶

Figure 6.14 AnimBrush Settings

Direction

◀

- Click the (backward) direction button and click Ok.

Now your gradient circle will rotate in the opposite direction when you paint with it.

◀▶ The other direction setting is called Ping Pong. This setting causes the brush to alternate between forward and backward play.

Duration

The Duration box in the AnimBrush Settings requester let's you specify how many stamps of the brush the AnimBrush uses to complete its cycle. If the Duration number is larger than the number of cels, the brush seems to move more slowly. If the Duration number is smaller than the number of cels, the brush seems to move more quickly. Let's try painting normally with a brush and then paint with the Duration set higher.

- Choose **AnimBrush>Load** from the Anim menu. Load the file named Sweep from the AnimBrushes drawer on the Art2 disk. Choose **Palette>Use Brush Palette** from the Color menu.

▶

- Display the AnimBrush Settings requester and set the Direction to play forward. (Notice that this animated brush has 10 cels.) Click Ok.
- Position the karate figure on the left side of the screen. Hold down the Alt key and click the mouse button repeatedly without moving the mouse to paint one cel of the animbrush on each of the 20 frames of your animation.

You now have an animation of a karate character performing a sweep kick twice. You'll notice that the sweep kick is fairly rapid. Next we'll paint the same animbrush with a longer duration to slow down the motion of the character.

- ▶ Choose **AnimBrush>Settings** from the Anim menu. Set the Duration box to 20. Set the Current box to 1 to put the brush at its first cel. Click Ok.

Now position the karate figure on the right side of the screen. Hold down the Alt key and paint one cel of the AnimBrush on each of the 20 frames.

When you've finished painting your AnimBrush on the 20 frames, press the 4 key at the top of the keyboard to play the animation.

Compare the speed of the two characters. If you step through the frames of your animation one at a time, you'll see that the man on the right takes two frames before changing position, while the man on the left moves on every frame. You can also use Duration to speed up an animbrush by setting the duration number lower than the number of cels in the brush. In that case, cels of the brush would be skipped as you painted with the brush.

❖ If you increase the duration of an AnimBrush, it is best to set a duration that is a multiple of the number of cels in your brush. For example, an AnimBrush that has 10 frames will generally look best if you set the duration to 10, 20, 30, etc.

Metamorphous AnimBrushes

Another way to create AnimBrushes is to transform the image and shape of one custom brush into those of a second custom brush. This special feature, called metamorphosis, can create some stunning effects. We'll show you a couple of very simple examples just to give you the idea. The first example metamorphoses between very different brushes. The second example metamorphoses between two transformed versions of the same brush. In both examples, you'll use the **Spare** options in the Brush menu to work with two custom brushes at the same time.

The Chicken and the Egg

In this example, you'll load two different custom brushes (a chicken, and an egg) and create an AnimBrush that metamorphoses between the two.

- ▶ Clear all frames of your animation.
- ▶ If the Animation Control Panel is NOT on your screen, press `Alt-A` to display it.
- ▶ Choose **Load** from the Brush menu, and load the file named egg.brush from the Brush drawer on Art1. Choose **Palette>Use Brush Palette** from the Color menu.

- Choose **Spare>Brush→Spare** from the Brush menu.

The **Brush→Spare** option copies your custom brush to the spare custom brush buffer. Now that you have the first brush in the spare buffer, you can load a second brush without losing the first one.

- Choose **Load** from the Brush menu, and load the file named "chicken" from the Brush drawer on Art1.

Now you have two custom brushes that you can swap back and forth between by choosing **Spare>Brush↔Spare** from the Brush menu. Try it if you like. Make sure that the chicken is your current brush before you proceed.

- Now choose **Spare>Metamorph** from the Brush menu. (The Make Animbrush requester appears.)
- Enter 11 in the edit box as the number of cels in your new brush, and click Ok.

It will take a couple of minutes for DeluxePaint to metamorphose your two custom brushes into one AnimBrush.

- Go to AnimBrush Settings, click on the ping pong direction button, and click Ok.

The Ping Pong option automatically plays your AnimBrush to the end and back again repeatedly without doubling the first or last cel of the brush. This means that the brush is effectively twice as long minus 2 cels. (In this case, we had you create an 11 cel brush so that the Ping Pong version would play over exactly 20 frames.) You'll find the Ping Pong option very useful for converting linear brushes into cyclical ones without having to create the extra frames.

- Hold down the *Alt* key, and click the brush repeatedly to paint the brush over 20 frames. Press 4 to play the anim, or click the Play Continuously icon on the Control Panel.

You'll see an egg metamorphose into a chicken and back into an egg over and over until you press the *space bar* to stop the animation.

The LightTable

The LightTable lets you see a few frames of animation overlayed on each other like clear sheets of cellophane to help you position brushes or paint the in-between frames of a character animation. The LightTable can also dim the frames that are behind (or after) your current frame so that you can more easily see which frame you are working on. (This dimming effect is available in all modes except HAM.)

Traditional animators work by painting the key positions or poses of a character and then paint the "in-between" frames to create the smooth transition between poses. The LightTable is ideal for creating animation with this traditional approach. In the next few pages, we'll introduce you to the basics of using the LightTable through an exploration of the techniques used to create the Doggie's_Inferno animation on your Art2 disk.

Simple 'Tweening

We'll start out with a simple example of painting a smiling face. To begin, we need a clean frame to work with.

▶ Delete all frames. Choose **Palette>Default Palette** from the Color menu.

▶ If the Animation Control Panel is not on your screen, press `Alt-a` to display it.

❖ The most obvious place to access the LightTable feature is from the Anim Control Panel, and this is the method we'll use in this example. However, if you prefer, you can also access this feature and its options from the Effects menu, or from the keyboard. Check Appendix B for keyboard equivalents.

▶ Click the + button on the Anim Control Panel to add a frame.

▶ Choose **AnimBrush>Load** from the Anim menu and load the brush Smile from the AnimBrush drawer of your Art2 disk.

This AnimBrush has only two cels, one frame shows a simple unexpressive face, the other shows a smiling face. We'll stamp these down on our two frames and then look at how the LightTable helps us create the in-between frames.

▶ Drag the Frame Slider in the Anim Control Panel to the left to move to frame 1. Stamp the first cel of the Smile brush on frame 1.

▶ Drag the Frame Slider to frame 2.

At this point, LightTable can already help us out. We'll use it to align the second cel of the AnimBrush over the first.

- Click the LightTable icon to turn it on.

You automatically see Frame 1 behind your current frame. Because you are working on an animation, DeluxePaint assumes that you will want to see the previous frame when you turn on the LightTable. Notice that the image on the previous frame is dimmed to help you see the difference between the current frame and the frames you are viewing behind.

- Position your AnimBrush directly over the image on frame 1 and stamp down the second cel (which should be a smiling face).

Now you have two frames, each containing one extreme of your future animation. The trick now is to draw the frames in between these two. The easy way to do this is to copy the first frame and modify it incrementally until you reach the state of the ending frame. Here are some steps:

- Drag the Frame Slider back to frame 1. Click the + icon in the Anim Control Panel to add another frame.

At this point you are on frame 2 looking at a copy of the information on frame 1 (the straight face). Since the goal is to make changes that will animate the face into the smile on the following frame, it would be helpful to see that frame while you make changes.

- Click the N (for next) button in the Anim Control Panel to show the next frame in the LightTable.

Now you can see your goal, so it will be easy to draw a face that shows a transition between what you have now (in the bright colors) and what you have on your last frame.

- Use the second round built-in brush and the Curve tool to draw eyebrows that curve a little higher and a lower lip that curves a little lower. Then use the Dotted Freehand tool to erase the original eyebrows.

- View your changes by clicking the loop forward icon in the Anim Control Panel. If the animation is too rapid, press the left arrow key several times to slow down playback. Press the spacebar to stop playback and use the Frame Slider to move back to frame 2 if you aren't there already.

- Continue to make changes and view them. When the changes look good to you. Go to frame 2 (the frame you were just editing), and click the + button again to add another frame to edit between frame 2 and the final frame.

Do you get the idea? You can keep making small changes and adding in-between frames until the transition to the full smile is perfectly smooth. You might even try evolving the simple face into a more full featured one with ears, hair, a chin, etc.

- If you like your animation, save it before moving on to the next section.

Evolution of an Animation

In this section we'll look at how a traditional animation evolves in DeluxePaint IV.

The Background

- Turn off the LightTable and delete all of your animation frames.
- Choose **Load** from the Picture menu and load the picture DoggieBackground.lace from the Picture2 drawer on your Art2 disk. When the message appears asking whether or not you want to change format to that of the file, click Yes.

The picture you see is a simple background image of a lawn and tree. This image forms the background for a completed Doggie's_Inferno animation. Before animators begin to draw an animation, they create a background image against which the animated characters will move. The background image can be as complex as a city scene or as simple as a straight line to indicate the ground level for the characters to walk on. Whatever its level of complexity, the background helps keep all of the pieces working in harmony.

In the next brief section, we'll load a wire-frame animation over the background image. But before we do, we need to change the screen format of this image.

- Choose **Change Screen Format** from the Picture menu. In the Screen Format requester, click Lo-Res 320x200, and Screen for the page size. Click OK. When the message appears to ask if you want the image stretched to fit the page, click Yes.

This will change the picture to Lo-Res format and resize it to fit the screen.

The Outline

Now we'll take a look at the first step of creating an animation over a background.

- ▶ Choose **Spare>Swap** from the picture menu to put the background picture on the spare page.
- ▶ Load the anim DoggieOutline from the Anim drawer on your Art2 disk. When the message appears to ask if you want to change the number of colors to that of the file, click No.
- ❖ You just performed an important operation; you loaded an 8-color wire-frame animation into 16-color mode. DeluxePaint lets you load animations into screen formats that use more colors and thus makes it possible for you to create the initial animation outline in just a few colors and load it into a format with more colors later on when you want to paint the frames.

DoggieOutline is a few frames of a simple wireframe animation. (The original outline animation was created in Interlace mode, but we converted it to LoRes so that you wouldn't see the flicker.) The Doggie's_Inferno animation (which we'll load in a moment) was created by an animator who uses the traditional method of first drawing the outline version of the animation and then filling it with solid colors or patterns to create a finished piece. Traditional animators call the outline version of an animation the "pencil test."

- ▶ Turn on the LightTable to view the animation frames overlayed on one another.
- ▶ Click the S button in the Anim Control Panel to view the Spare page behind the animation.

See how useful it is to view the background image through your animation frames? With the background visible, the animator can easily align the animated characters without having to worry about accidentally ruining the background image. Even if you aren't working on an animation, you might find it useful to view a background image while you paint. If you turn off the Dim option (from the LightTable submenu of the Effects menu) you can view the background in its original colors and thus treat your animation frame as a transparent page.

- ▶ Choose different combinations of settings (2, P, N, and S) in the LightTable area of the Anim Control Panel. Move the Frame Slider back and forth to view the different animation frames and background combined with the various settings.

Merging in the Background

One of the powerful features of the LightTable is its ability to let you merge your viewed frames. We'll try it right now by merging the background image into the image on one of the frames.

- ▶ Make sure LightTable is on, but turn off all of the LightTable options other than S (for Spare).

You should see your current frame against the background on the Spare page with no other frames visible.

- ▶ Choose **LightTable>Merge** from the Effects menu.

In a moment, your background is merged with your wireframe animation. Notice that the LightTable is automatically turned off after a merge operation. This is done so you will see the frame in its actual state and not be confused by LightTable effects. One caution is in order: you can't Undo a merge, so you should be very careful that the image as you see it in the LightTable is correct before you merge it.

Another way to merge the background image with the frames is to use the **Spare>Merge in Back** option in the Picture menu. This option lets you merge to the current frame, to a range of frames, or to all frames in a single operation. This is generally the last step an animator takes in the creation of a finished traditional piece. If you have enough memory in your Amiga, you can try it yourself after you view the painted animation frames in the next section.

The Painted Animation

Before we leave this section, we'd like you to load the Doggie's_Inferno animation and, if possible, merge it with its background. We've included two sets of instructions: one set for those with less than 2MB of RAM, and one set for those with 2MB or more.

If you have less than 2MB of RAM:

- ▶ Choose Load from the Anim menu and load the Doggie's_Inferno animation from the Anim drawer of the Art2 disk. When it has finished loading, press 4 on the keyboard to play the animation.

Be sure to read the Tip below! If you don't have a lot of RAM, it is an especially useful tip.

If you have 2MB or more of RAM:

- ▶ Choose **Frames>Delete Frames** from the Anim menu. In the requester, click Delete All.
- ▶ Choose Load from the Picture menu and load the DoggieBackground picture from the Picture2 drawer of the Art2 disk.

- Choose **Spare>Swap** to move the background image to the spare page.
- Choose **Load** from the Anim menu and load the Doggie's_Inferno animation from the Anim drawer of the Art2 disk. When the message asks if you want to change the number of colors to that of the file, click No.

Once you have both the background and the full-length painted version of the animation loaded, you can merge the two together to build the final animation.

- Choose **Spare>Merge in Back** from the Picture menu. When the Merge requester appears, click All Frames to merge the background image behind all of the animation frames. When the process is finished, press 4 on the keyboard to view the finished animation.

TIP If you are going to be *recording* your animations to video tape and you don't have a lot of RAM in your Amiga, it might be best *not* to merge a background into your animation. Instead, you can create a painted background and use a GenLock device to combine the video signal of the Amiga with the signal of a camera focused on the painted background as you record the two to a videotape.

Brush Axes vs. Screen Axes

Now that we've covered pretty much everything else, it's time to cover the sticky issue of brush vs. screen axes. We've tried to make the example very clear, but if you feel you need further help, review Chapter 5, ***Working with Perspective***. We should also mention that you will not often need to change the default settings for these options.

Movement Along the Brush Axes

So far in our examples, we've been moving the brush along the screen axes. When your brush is in a standard orientation (0, 0, 0), movement on the brush axes is the same as movement on the screen axes. If you rotate your brush using Perspective, the brush axes may no longer correspond to the screen axes, and movement on the brush axes will be different. In this example we'll use the Load Move requester to set some of our movements.

- Choose **Screen Format** from the Picture menu and change your format to Lo-Res 320 x 200 with 32 colors.
- Choose **Frames>Set #** from the Anim menu and set the number of frames to 20.

- Choose **Load** from the Brush menu and load the brush called DPaintTitle brush from the Brush drawer on your Art1 disk.
- Choose **Palette>Use Brush Palette** from the Color menu.
- Click CLR to clear your screen to black.

You should now have a clear page and and the DPaintTitle brush ready to work with.

- Choose **Perspective>Do** from the Effect menu to enter Perspective mode.
- Move the brush down near the bottom of the screen and press `Shift-7` to flop the brush over on its back.
- Click to paint down the brush.

To flop the brush over on its back, you rotated it -90° on the X axis (see the Title Bar) and shifted the brush axes so that they no longer correspond to the screen axes. Figure 6.15 illustrates the change in the brush axes.

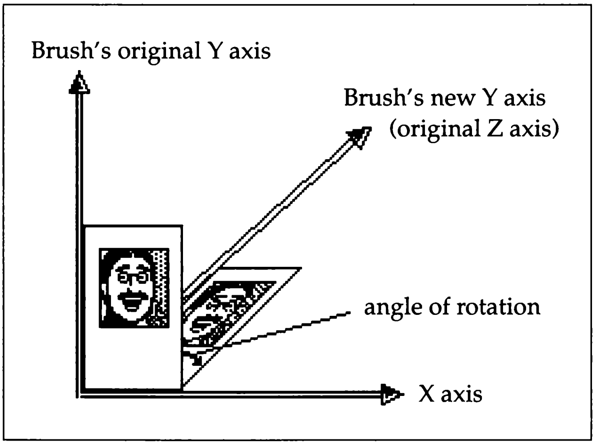


Figure 6.15 The change in a brush's axes upon rotation

Now if you use the Move requester to move the brush along the Y axis, you will get different results depending on whether or not you have selected the Brush button.

- Display the Move requester, and click Load.
- When the Load Move requester appears, load the file called Animbasics1.Move from the Move drawer of Art1.
- Click Preview from the Move requester.

The wire frame model of your brush moves upwards, just as you would expect when moving along the screen axis.

- ▶ Click the Brush button beside the Distance edit boxes. A check mark (√) appears in the box. Now click Preview and watch the direction the brush moves.

This time the brush moved into the distance along the Y axis of the brush. As Figure 6.15 above shows, the brush's Y axis is the same as the screen's Z axis when you rotate backwards -90°on X as we did.

Rotation on the Brush's Axis

You may have already guessed what will happen when we rotate the brush on it's own axes rather than on the screen axes, but this is sometimes difficult to visualize, so we'll give an example.

- ▶ Click Cancel to close the Move requester
- ▶ Click CLR and click All Frames in the requester to clear all frames.
- ▶ Choose **Perspective>Reset** from the Effect menu to reset all of the Perspective settings.

At this point you once again have your brush in the original orientation and are in Perspective mode. Now we'll rotate the brush on the Z axis, so that the X and Y axes of the brush no longer match the X and Y axes of the screen.

- ▶ Hold down `2` on the keypad until the brush has rotated 45° on the Z axis. You'll see the degrees of rotation in the right side of the Title Bar.
- ▶ Paint down the brush in the middle of the screen.
- ▶ Press `M` to display the Move requester.
- ▶ Click Clear in the requester.
- ▶ Click Load. When the Load Move requester appears, load the file called Animbasics2.Move from the Move drawer of Art1.
- ▶ Make sure the Brush button beside the Angle edit boxes doesn't have a √ on it.
- ▶ Click Preview.

With the settings above, you'll see the brush tumble toward the screen on the X axis. Remember that the brush is rotating on the *screen's* X axis. Now let's look at a rotation on the brush's X axis.

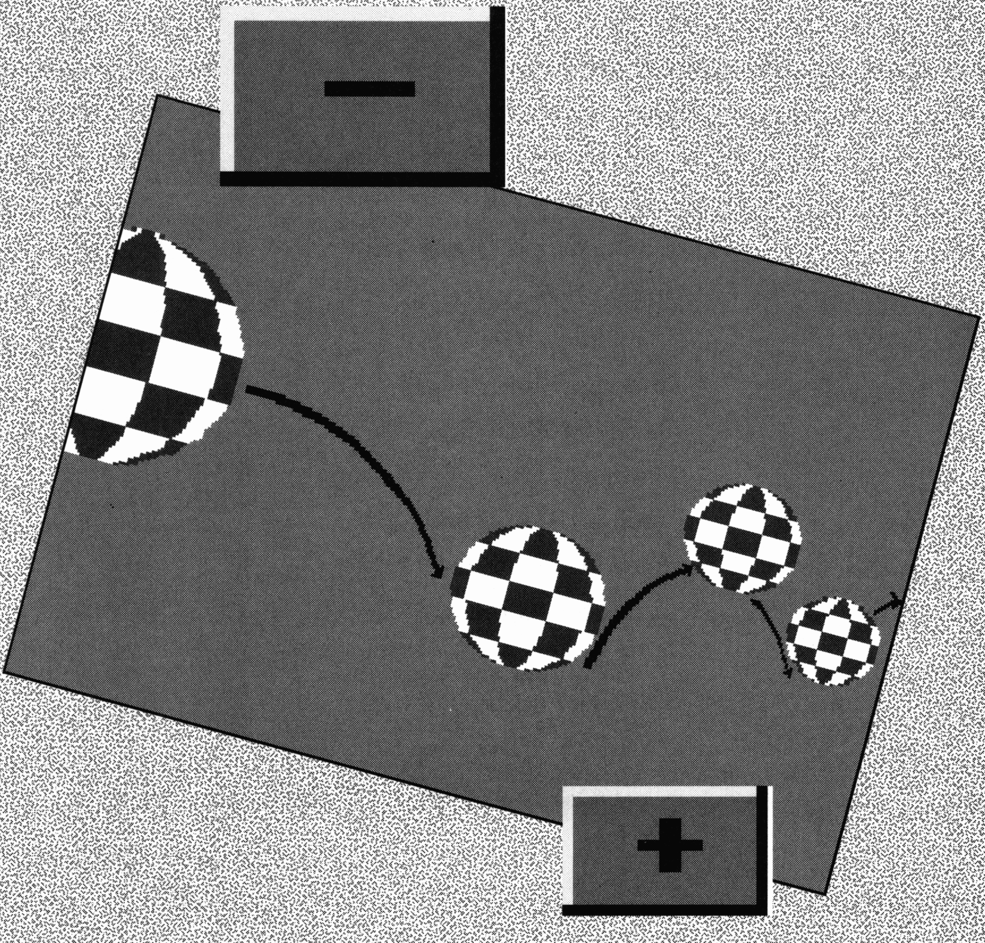
▶ In the Move requester, click the Brush button beside the Angle edit boxes; click Preview.

This time the brush spins around its own X axis instead of tumbling toward the screen. The idea is the same for all rotations, though it isn't always easy to predict what a complex set of rotations will look like. You'll probably find that most of your moves can be accomplished with rotation around only one axis at a time. And once you get used to rotations on the brush axes, we think you'll use these most often, so brush rotations are the default setting.

Tip If this last exercise was less informative than you had hoped, you should probably review the chapter on Perspective. There you will find more examples that might help you better understand the difference between screen and brush angles.

Now that you've seen some of DeluxePaint's animation features, you might like to play around a little. Load the animations from Art2 disk and play them. There are several AnimBrushes on the disk that you can combine with the Ocean Background.picture to form an aquarium scene. When you feel you're ready to see some more of DeluxePaint's animation features, move on to the next chapter. It shows you how to create some interesting animation effects by combining different features of the program.

Notes



Animation Effects

7

Chapter 7: Animation Effects

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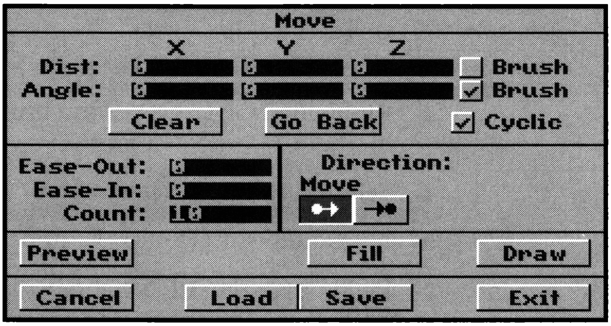
This chapter introduces several interesting animation effects and a host of animation tips. We strongly recommend that you work through this chapter and complete the Amazing Bouncing Ball section, which serves as a good test of your knowledge of DeluxePaint.

Effects

In the following sections you'll create some interesting animation effects. Many of these effects are not obvious, so it is worth your time to follow closely and work along.

NOTE: As you begin each section that uses the Move requester, reset the requester to its default settings. Our instructions will tell you only which settings you need to change out of the defaults when you first open the requester. Figure 7.1 shows the Move requester in its default settings; use this as a guide if you need to check your own settings.


Move

Dist: X 0 Y 0 Z 0 ☐ Brush

Angle: X 0 Y 0 Z 0 ☑ Brush

☑ Cyclic

Ease-Out: 0

Ease-In: 0

Count: 10

Figure 7.1 Move Requester showing default settings

Before You Begin

- ▶ Make sure you are in Lo-Res mode with 32 colors. Set your number of frames to 40. Make sure you are using the Compressed memory method.

Quick Effects

These two effects are good examples of how multiple features of DeluxePaint combine to make simple animations easy to create.

Receding or Approaching Shapes

This technique creates the effect of a shape moving off into the distance. Notice that this involves using a keyboard command while you paint with the mouse button down.

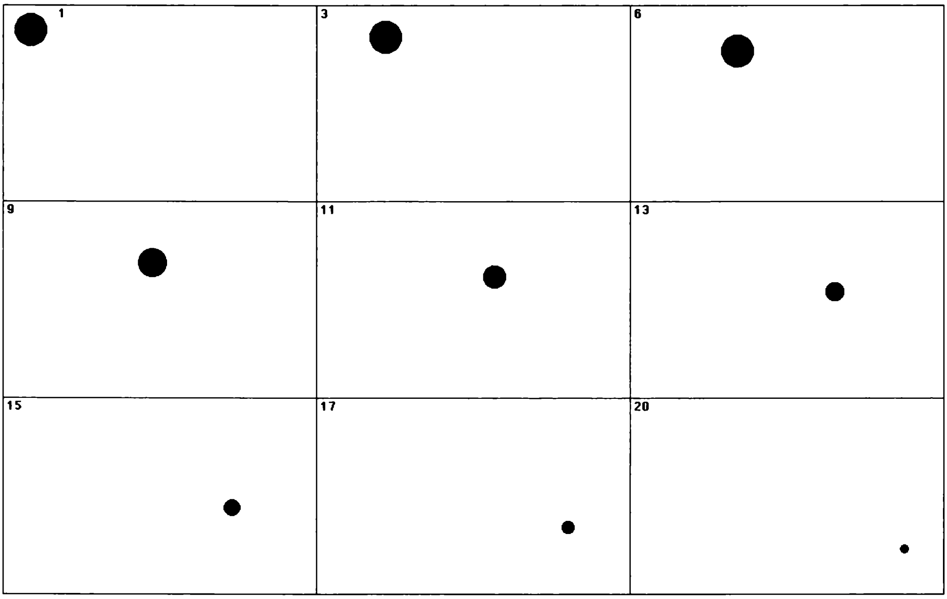


Figure 7.2 A receding circle

- Right-click the largest round brush and stretch the brush to be about the size of a nickel.
- Select the Dotted Freehand tool.
- Position the brush near the upper left corner of the screen.
- Hold down the Alt key and begin animpainting in a curve downward toward the lower right area of the screen. As you paint, release the Alt key and press the - (minus) key repeatedly to shrink the brush as it moves.

When you play back the animation, the gradual shrinking of the brush makes it look as though it is receding into the distance. Play the animation backwards, or create a new one using the = (equals or plus) key to enlarge the brush, and the brush will appear to approach from the distance. This example used a built-in brush, but you can do the same thing with a custom brush.

Dissolve

The **Edge>Trim** command in the Brush menu makes it easy to have an object dissolve into nothing. You stamp the brush, trim some away, step to the next frame, and stamp again. The real trick is to use the keyboard to do all of your frame changes, trimming, and brush stamps.

- Select black as your background color and clear all of your frames.

- Load the DPaintTitle brush from your Art1 disk. Choose **Palette>Use Brush Palette** from the Color menu. Stamp the brush in the middle of frame 1
- Display the Move requester. Click Clear to set all of the Distance and Angle edit fields to 0.
- Set the Count to 1. Make sure that all of the other options are set to their defaults. Click Draw.
- Press `o` to trim the brush. Press `M` to display the Move requester and click Draw. Repeat this step until the brush has completely disappeared. (It will take about 9 frames.)

Using the Move requester to stamp your brush saves you from having to carefully position the brush on each frame. You can also accomplish this by positioning the brush once and then using the keyboard equivalent Amiga-Left Alt to click the left mouse button. (We recommend that you press the Amiga key first and then press the Alt key quickly once for a single stamp, because pressing the keys in the opposite order will start animpainting over many frames.)

Since you didn't use all 40 of your frames, we'll use the **Control>Set Range** option in the Anim menu to play just the frames you painted.

- Choose **Control>Set Range**. In the Set Play Range requester, set the From field to 1 and the To field to 10. Click Range. Click Ok.
- Now press `4` to play your animation and you'll see your brush dissolve repeatedly until you press *space bar* or click to stop the animation. (If the animation is moving too quickly, press the left arrow key repeatedly to slow it down.)
- Before you leave this example, choose **Control>Set Range** again and click the All Frames button.

Expanding Circles

This example shows you how to create the effect of a circle expanding outward like a "sonar blip." You use two DeluxePaint features to help you align the circles and make them grow uniformly: Grid and the **2** key (the Next Frame keyboard equivalent).

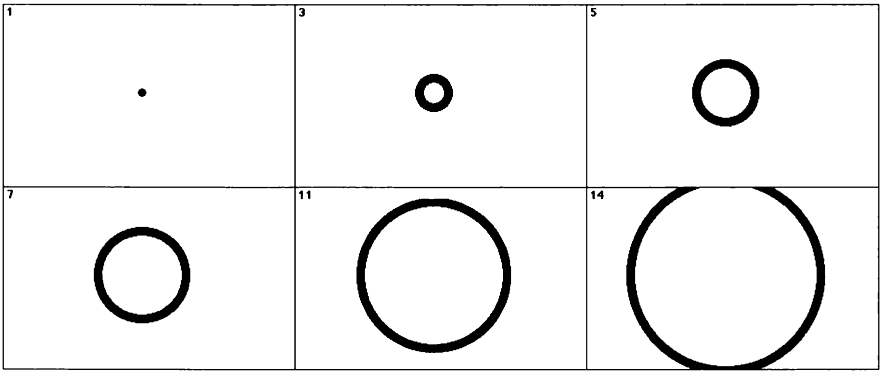


Figure 7.3 Expanding Circles

- Clear all frames of your animation and go to frame 1. Turn on the Grid with X and Y spacing of 8.
- Select the second-largest round built-in brush and paint a dot in the center of the screen.
- Choose the Unfilled Circle tool.
- Start from the dot in the center of the screen and drag out a circle that is just one grid point wider than the dot, but don't release the mouse button. Press the **2** key to move to the next frame. Now release the mouse button.

At this point you have a dot on frame 1 and a small circle on frame 2.

- Continue to follow the last step above to paint larger and larger circles on successive frames until your circle reaches the sides of the screen.

When you play your animation, you'll see one circle expanding outward. If you're adventurous, try picking up your entire animation as an AnimBrush and animpainting it onto your existing animation by starting it on frame 5. This will give you an animation of two circles expanding outward.

Trails

This example demonstrates the use of Trails. You'll find this option in the Move requester makes it easy to create impressive title effects.

- Turn the Grid off, and clear all frames.
- Load the brush DPaintTitle from the Art disk. Choose **Palette>Use Brush Palette** from the Color menu.

- Press `Shift-2 to` go to the LAST frame. You should be on frame 40.
- Stamp the brush at the bottom of the screen. Display the Move requester. Click Clear. Set the Z Distance to -1500. Select the Come To option for your Move Direction.

The Come To option tells DeluxePaint that the position of the brush is where you want the animation to end—you want the animation to "come to" the brush position and frame.

- Set Count to 40, and click Preview.

  There is a slight delay, and then the preview plays, starting at the distant position [Z=1500] and coming closer.

- Instead of clicking Draw, click Trails, and let it record.

By clicking Trails, you tell DeluxePaint to carry the cumulative effect of each frame forward as it draws. The result is that the brush leaves a trail as it moves through three-dimensional space in your animation.

- Press `5` on the main keyboard for a single play of the animation.

The Slinky

The Slinky is a modified version of the standard Trails title. You've probably seen this effect on many television sports shows. A special feature of this effect is that it uses the Stencil in combination with the Move requester. This combination can be very powerful when used properly. When a stencil is used with the Move requester, DeluxePaint remakes the stencil for each frame as it renders the move.

- Load the DPaint. brush if you don't already have it. Clear all frames.
- Step to the middle frame of your total. For example, if you have 40 frames as we suggested, move to frame 20 by choosing **Control>Go to** from the Anim menu. Stamp the brush down near the bottom of the screen.
- Display the Move requester. Click Clear. Make sure that both Brush buttons are unchecked.
- Set the Z Distance to -1000. Set the Count to 20. Select the Come To option. Click Trails.

As in the Trails effect above, DeluxePaint paints your title with the cumulative image carried forward to each successive frame.

- Step to frame 40.

Now you need to create a stencil so you can "paint behind."

- Choose **Stencil>Make** from the Effect menu. In the Make stencil requester, click the background color (black), click Invert, and click Make to lock all colors but the background.
- Display the Move requester. Leave all of the other settings the same, but select the backwards Record Direction. Click Trails.

Because you reversed the Record direction, DeluxePaint begins this move by painting on frame 40. It then steps one frame backwards and paints the cumulative effect of frame 40 and the new brush position on frame 39. This is where the Stencil comes into play. Because the colors in the title are stenciled, the second brush stamp appears to be painted "behind" the single image that was stamped on frame 40. Though, in fact, it was painted over the single image.

The resulting animation should have your brush moving from the distance, leaving Trails, until it gets to the nearest position, at which point the Trails start erasing from the back forward.

- Before you move on to the next effect, choose **Stencil>Free** from the Effect menu.

Curving Titles

This example shows you how to create the effect of a title moving across the screen on a curved path using the curve tool instead of the Move requester.

- Clear all frames.
- Load the DPaintTitle. brush from your Art1 disk. Choose **Palette>Use Brush Palette** from the Color menu.
- Go to the last frame (frame 40) and stamp the brush near the bottom of the screen. Click Undo.

TIP Clicking UNDO immediately after stamping the brush helps ensure that your results are what you expect. This is particularly important if you are using a Brush Mode in your move, because DeluxePaint paints on the screen you stamped on when it paints the move, and stamping twice on the same screen will give a different result from a single stamp.

- Display the Move requester, and click Clear.
- Set the Z distance to -1200. Select the Come To option. Set Count to 40, and click Draw.

DeluxePaint paints the brush moving toward the screen from the distance.

- Pick up the animated title as an AnimBrush. (Be sure you are on frame 1 when you pick up the brush, and that you enclose the entire area over which the brush moved.)
- Press `Alt-x` to place the brush handle in the lower right corner of the brush so you will be able to click it off-screen.
- Clear all frames.
- Right-click the Curve tool to display the Spacing requester. Click the N Total button and set the total to 40. Click Ok.

The Spacing requester lets you tell DeluxePaint exactly how many brush stamps you want to use to paint your curves, lines, and unfilled shapes. By setting the Spacing to N Total of 40, you'll get 40 stamps of the brush. Since you have 40 frames, when you use the brush to animpaint, you'll get one stamp of the brush on each frame.

- Press `Shift-7` to go to the first cel of the AnimBrush.
- Position the brush at the left side of the screen and midway between the top and bottom.
- Hold down the *Alt* key and the left mouse button and drag down to the lower right corner of the screen. (You'll see your title drawn along the path of your curve.)
- Release the mouse button and define the shape of the curve while still holding down the *Alt* key. When the curve is a shape you like, click to begin animpainting.

When DeluxePaint is finished painting your curve, press 5 to play the animation once. You'll see the brush move into view and curve it's way down to the lower right corner of the screen.

Tumbling 3D Objects

Like the Curving Title effect above, this effect also uses the curve tool to move an AnimBrush along a curved path. However, in this effect, you use an object that looks three-dimensional, and you tumble it at the same time you move it toward the screen.

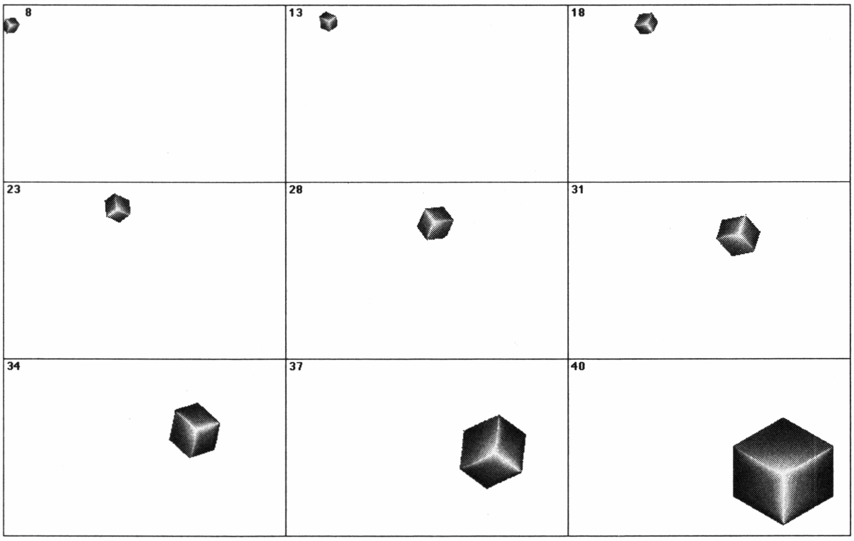


Figure 7.4 Object tumbling into the screen along a curved trajectory

- Clear all frames.
- Load the brush named GradientCube from the Brush drawer on your Art disk. Choose **Palette>Use Brush Palette** from the Color menu. Go to the last animation frame (frame 40). Stamp the brush in the center of the screen. Click Undo.
- Display the Move requester. Set the Z Distance to -1200 and the Z Angle to 720. Select the Come To option. Click Draw.

DeluxePaint paints your cube rotating 720° and moving toward you from the distance. Now you need to pick up this tumbling object as a brush. You must pick up the entire animated area, beginning at frame 1 where you see only a tiny object. Here's how:

- Click the Brush Selector.
- Go to frame 40, where the object is largest.

From this frame you can easily see how large an area you need to select to enclose the entire animated area of the gradient cube.

- Hold down the Alt key and enclose the object with your cross-hair, but don't release the mouse button. (You can release the Alt key.)
- Press 2 to step forward to frame 1. Release the mouse button.
- Click Ok in the Pick AnimBrush requester.

Now you have your AnimBrush of the object tumbling and moving toward you. In the next steps, you'll use the Curve tool and the Spacing requester to give it a trajectory across the screen.

- Clear all frames.
- Right-click on the Curve tool. Set the Spacing requester to N Total 40.
- Place the brush handle in the lower right corner of the brush so you will be able to click it off-screen.
- Press `Shift-7` to go to the first cel of the AnimBrush.
- Select the Curve tool if it is not selected.
- Position the brush at the left side of the screen and midway between the top and bottom.
- Hold down the *Alt* key and the left mouse button and drag down to the lower right corner of the screen.
- Release the mouse button and define the third point of the curve while still holding down the *Alt* key. When the curve is a shape you like, click to begin animpainting.

Notice that even though the cube has only two true dimensions, the combination of the three-sided view and the tumble make it appear as though the brush is three-dimensional.

Planetary Orbits—Brush Handles

This example shows you how to create an animation that simulates the orbit of a planet. This demonstrates the importance of brush handles—when you rotate a brush, the rotation always takes place around the brush handle.

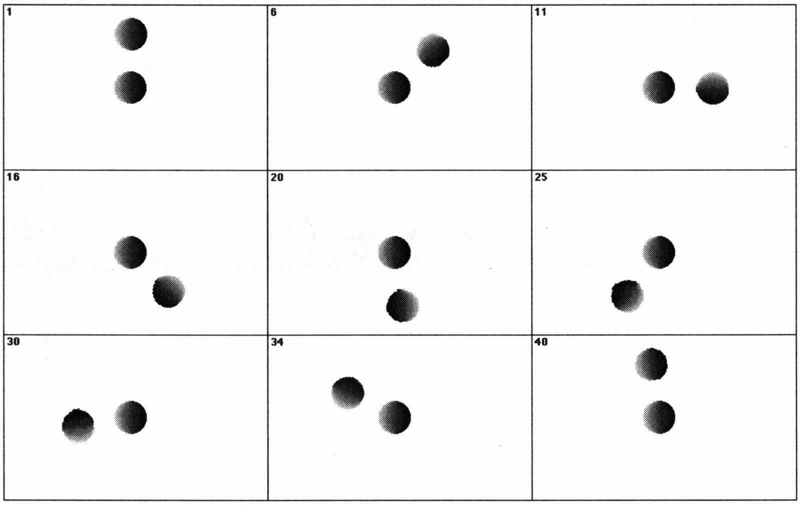


Figure 7.5 Orbiting planets using brush handle

- Paint a circle about the size of a quarter and filled with a gradient. Pick the circle up as a brush.
- Clear all frames.
- Stamp a copy of the brush in the middle of the screen.
- Display the Move requester and click Draw to draw 40 frames of your brush.
- If you are holding the brush by its corner, first choose **Handle>Center** from the Brush menu. Now choose **Handle>Place** from the Brush menu.

Your brush now has a cross-hair running through the center of it.

- Position the brush about an inch and a half above the circle you painted in the middle of the screen. Hold down the left mouse button, drag straight down to the center of the ball you painted, and release the mouse button.

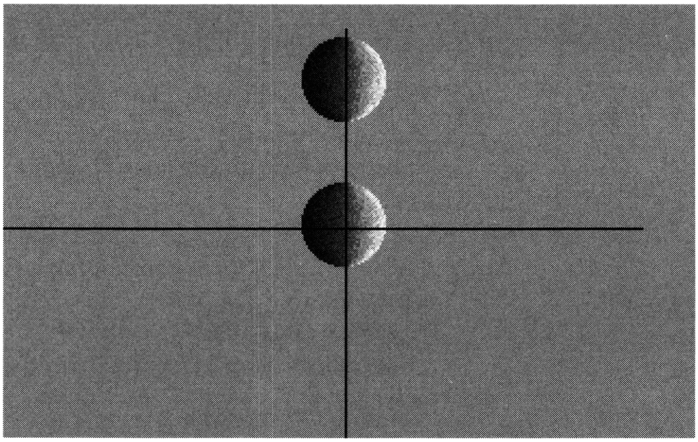


Figure 7.6 Placing the brush handle

Now your brush is offset from the cursor by about two inches. We'll use this brush to create an orbiting planet.

- Point at the center of the stamped circle with the cursor and click. (This stamps your circle brush above the circle in the middle of the screen.)
- Display the Move requester. Set the Z Angle to 360. Click Draw.
- Play the animation back and you'll see that your planet orbits around the central circle!

Using the brush handle effectively becomes a little more complicated when you rotate over more than one axis, but you might want to spend a little time trying different settings to see the effects you can create.

Scrolling Background

This section shows you how to create a scrolling background from a single picture. All you need to create this effect is a picture with left and right edges that meet to form a seamless image.

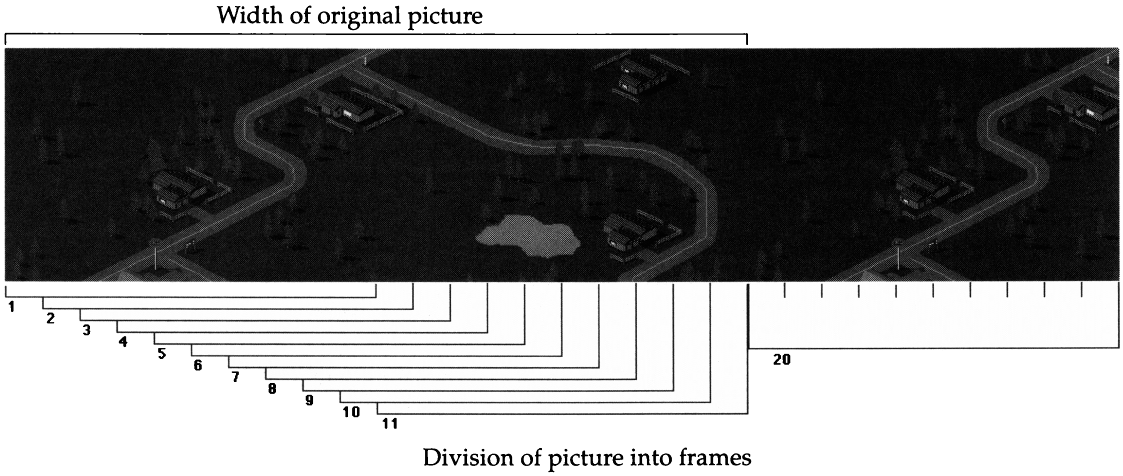


Figure 7.7 Scrolling background

- ▶ Choose **Frames>Set #** from the Anim menu and set your number of frames to 32.
- ▶ Clear all frames.
- ▶ Load the picture named DinoBackdrop from the Picture drawer on your Art1 Disk.

In the next step, you remove the gradient from the ground in the picture to reduce the amount of memory required for the animation. Since you are working in the Compressed memory model, each pixel of your animation that changes from one frame to the next uses memory. By removing the gradient, you reduce the number of pixels that change, and thus the amount of memory required. Still, this scrolling background will use a lot of memory. If you are using a 1 megabyte system, you will probably not be able to add any additional animation to the background.

- ▶ Change your background color to the primary orange color of the ground in your picture. You can use the Pick eye dropper to do this quickly.

- ▶ Select the Brush Selector tool and pick up the ground using the right mouse button. This will remove the gradient and leave the primary orange color behind.
- ▶ Click the Brush Selector again and pick up the entire picture as a brush. Click CLR and clear all frames to the orange background.
- ▶ Stamp the picture back down as it was before. Display the Move requester. Set the X Distance to -320. Set Count to 32. Click Draw.
- ▶ When DeluxePaint is finished drawing your move, press Alt-x twice to hold your brush by the lower left corner. Position the cursor in the very bottom right corner of the screen. (This aligns the left edge of your brush with the right edge of your picture on frame 1.) Stamp the brush in place. Display the Move requester and click Draw.

DeluxePaint paints a second version of the DinoBackdrop picture to complete the 32 frame scrolling background. Play your scrolling background to see how it looks.

This example showed you how to create a scrolling background that simulates a camera panning from left to right, but you can create one that moves in any direction by following the same basic steps. You can also use a picture that is larger than an animation frame to create your scrolling background. To do this, you create a large Spare page and load or paint your large picture. Then you pick up the pieces of the picture in frame-size chunks and put them together just as we did above, except that after you put together two pieces, you go to the Scratch page for the next chunk of picture and position at the first *blank* frame (in our case the first blank frame would be frame 33 if we had additional frames) and do the same move as before.

Filled Plane Effects

The following effects use the Fill option in the Move requester to create filled planes that move. In the first example, the plane moves toward you so that it seems as though you are traveling, in the second example, the filled plane rolls as though you are doing a roll in an airplane.

- ▶ Set the number of frames to 20.
- ▶ Create a simple filled circle brush to use for your filled planes. (If you are on a 1 megabyte Amiga, don't add any gradient or other detail, because these filled plane moves require a lot of memory even with a simple brush.)

Tip For the Moving Ground example, it helps if your brush height is a multiple of the number of frames you have. This will produce smoother results. (Use Coordinates in the Prefs menu when you draw the brush and pick it up to confirm that it is the dimensions you want.)

Moving Ground

- Enter Perspective.
- Position the brush near the bottom right corner of the screen and press `Shift-7` to rotate the brush -90°. Stamp down the brush. Click Undo.
- Right-click the Grid tool and note the number listed for the Y Grid value in the Perspective requester. Click OK.
- Display the Move requester. Set the Y Distance to the same number as the Y Grid value only make the number negative. Click the Brush button beside the Distance boxes so that you move along the brush's coordinates. Make sure the Count is set to 20. Click Fill.

DeluxePaint will take a while to paint your 20 frames. When it is finished, the animation will show a plane of circles moving toward you.

Rolling Horizon

- Clear all frames. Choose **Perspective>Reset** from the Effect menu.

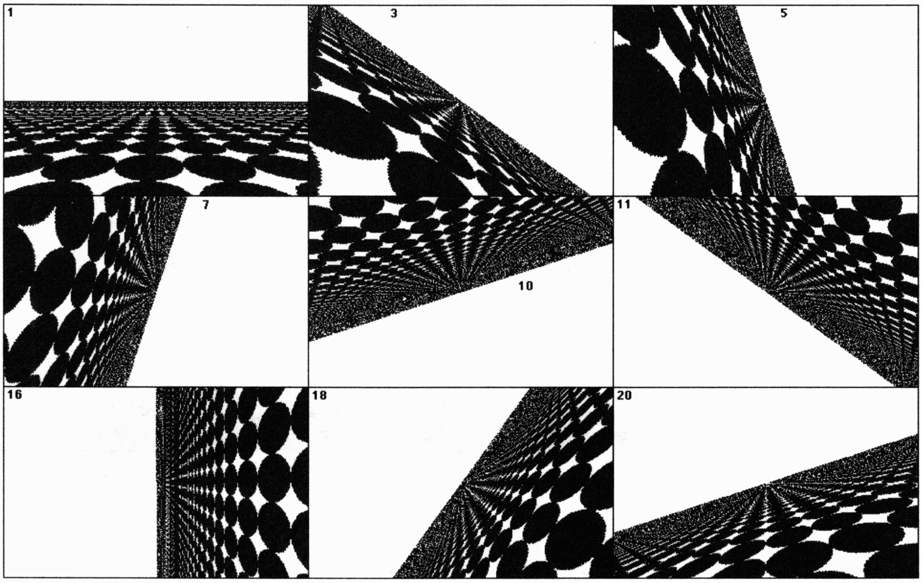


Figure 7.8 Rolling Horizon

- ▶ Press Enter on the keypad twice (this takes you out and then back into Perspective).
- ▶ Position your brush near the bottom of the screen. Rotate the brush to -90° on the X-axis. Stamp down the brush. Click Undo.
- ▶ Display the Move requester. Click Clear. Set the X Distance to -640 and the Y Angle to 360. Make sure both Brush buttons are selected. Click Fill.

Again, DeluxePaint takes a while to paint your 20 frames. When it is finished, the animation will show the filled plane of circles rotating 360° around the perspective center.

Spinning Effects

Here are two terrific spinning effects. In the process of creating these effects, you'll need to use a range of DeluxePaint features. At this point we assume you are familiar with all of the features, and our instructions are, at times, general. These exercises are a good way to test your knowledge of the program; if you get stuck, you should look up how to perform the task we describe.

Amazing Bouncing Ball

A bouncing ball sounds complicated, doesn't it? With traditional media, it would indeed be tedious, but with DeluxePaint, you can master the effect in no time at all.

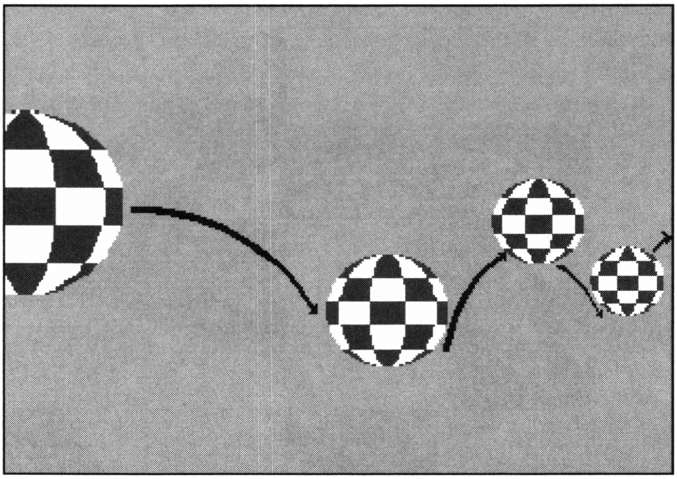


Figure 7.9 Amazing Bouncing Ball

To produce the spinning effect we want for the bouncing ball, you would ordinarily need to do several things:

- ☐ Create a range of colors to cycle

- ☐ Create a checkerboard pattern and wrap the pattern onto a circle to make it appear spherical.
- ☐ Create a ball-shaped brush and rotate it so the ball spins on an angle.

These steps are not necessary for this exercise, however, because we have created a ball for you to use.

- ▶ Load the brush named Ball.Brush from the Art1 disk. Choose **Palette>Use Brush Palette** from the Color menu.
- ▶ Set the number of frames to 10 and clear all frames.

Now to give the ball some bounce.

- ▶ Go to Frame 1.
- ▶ Stamp down the brush so the bottom edge is near the bottom of the screen.
- ▶ Display the Move requester, and click Clear.
- ▶ Set the Y distance to about 75. Set Ease In to 10. Set the Count to 10. Select Go From. Click Preview.

  The brush should move upward until it almost reaches the top of the screen. If it goes too far or not far enough, adjust the Y Distance setting and try Preview again.
- ▶ Click Draw.

Now that you've given the ball some bounce, you pick it up as an AnimBrush and send it bouncing off into the distance by using the Move requester.

- ▶ Pick up the animated ball as an AnimBrush. Choose **AnimBrush>Settings** from the Anim menu. Click the Ping Pong icon. Click Ok.
- ▶ Clear all frames. Set the number of frames to 40 and Go to Frame 1 of the animation.
- ▶ Move the brush handle to the lower right corner of the brush.
- ▶ Go to cel 7 of the AnimBrush. Place the cursor in the lower left corner of frame 1 (so the brush is off the screen) and stamp down the brush.
- ▶ Display the Move requester, and click Clear. Set the X Distance to 850 and the Z Distance to 500. Set the Count to 40. Set Ease In to 0. Click Draw.
- ▶ Turn on Color Cycling and play the animation.

You'll see a remarkably realistic animation of a spinning, bouncing ball. If you are adventurous, try creating a plane for the ball to bounce on. You'll need to adjust the plane's position to match the bottom of the ball where it bounces. Then you create the plane on the Spare page and merge it behind the animation. When you choose the **Spare>Merge in back** option, DeluxePaint asks if you want to merge behind all of your frames. This feature makes it easy to build up animations from several elements.

Creating the Spinning Ball

Here are the steps for creating the spinning ball. First you need to create a range of colors to cycle. These will ultimately produce a spinning effect.

- ▶ Display the Color Mixer and create a spread of eight identical reds and eight identical whites.
- ▶ Choose **Ranges** from the Color menu to display the Range requester. Select an empty range or clear the first range and define these colors as a range by setting the eight whites and eight reds next to each other along the Range bar. Set the Rate for color cycling to the maximum. Check Random and slide the Dither slider all the way to the left to turn dither completely off. (Make sure that your reds and whites aren't in any other ranges.)

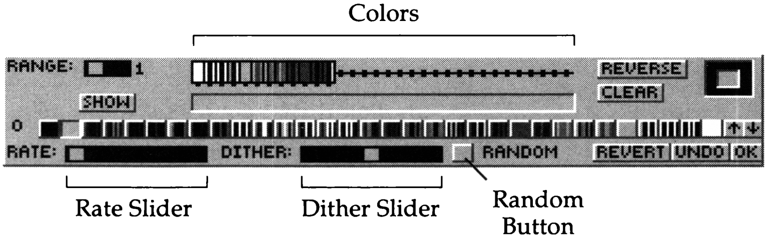


Figure 7.10 Range requester

Now you create a checkerboard pattern and wrap the pattern onto a circle to make it appear spherical.

- ▶ Display the Fill Type requester. Select the red and white range you created. Select the first gradient fill option for a plain horizontal fill.
- ▶ Select the Filled Rectangle tool. Turn on Coordinates. Select black as your background color and clear the screen. Paint a rectangle that is 44 pixels wide and 22 pixels high.

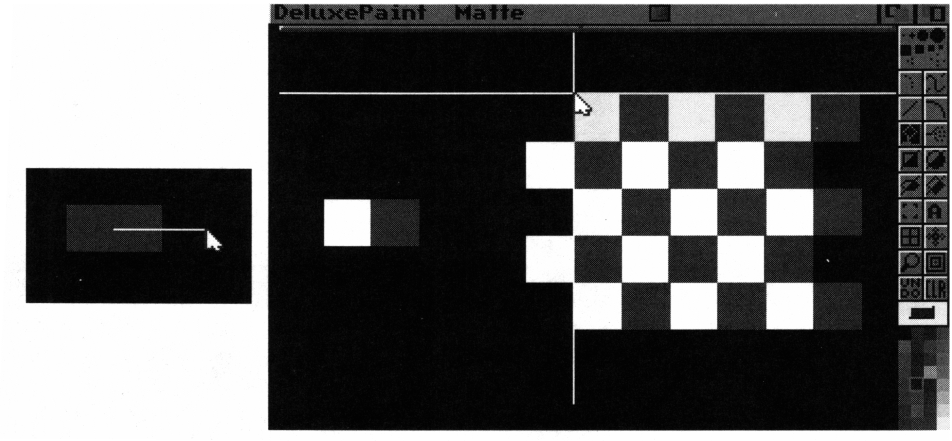


Figure 7.11 The two color rectangle and the checkerboard

You should now have a rectangle that is white on one side and red on the other.

- ▶ Pick up your rectangle as a brush and create a red and white checkerboard pattern. Then pick up exactly a 5 square by 5 square section of the checkerboard as a brush.
- ▶ Clear the screen. Display the Fill Type requester. Select Brush Wrap fill.
- ▶ Turn on **BeSquare** in the Prefs menu (so your circle will be truly a circle). Paint a filled Circle that is approximately 3 inches across.

There it is. Press the Tab key to see the ball cycle. You'll find more information about color cycling and color ranges in Tutorial Two of Chapter 4, ***Painting Tutorials.***

The Spinning Globe

This example shows you how to create a spinning globe from the WorldMap picture on your Art1 disk. To accomplish this effect, you create a scrolling background, pick up a section of the background as an AnimBrush, and use it to animfill a circle using the Wrap fill type.

❖ If you are working on a 1MB Amiga, we recommend that you start this example from a fresh start of the program in Swap mode (chosen from the initial Screen Format requester). This fresh start will ensure that you have no memory fragmentation and Swap mode will give you the most memory to work with. This example is very memory intensive and may not work on some 1MB configurations.

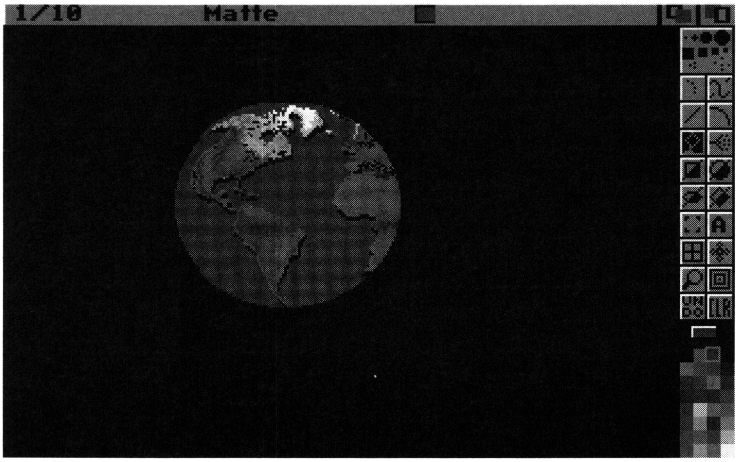


Figure 7.12 The final globe animbrush sequence

- Set the number of frames to 10.
- Go to frame 1 and load the picture WorldMap from the Art1 disk into the frame.
- Pick up the entire map image as a brush. You should use the blue background as a reference for what area to pick up.
- Choose **Replace** from the Mode menu to put your custom brush in Replace mode.

You don't want any of the areas of your brush to be transparent; Replace mode replaces any colors of your image that would have been transparent in Matte mode. (If you're not familiar with the brush modes, we recommend that you review them in the ***Reference.***)

- Clear all frames and press F10 to hide the Toolbox and Title Bar.
- Place the brush handle in the lower right corner of the brush and stamp the image down in the center of the screen by placing the cursor in the lower right corner of the screen.
- Display the Move requester and set the X distance to 320 (the width of the image). Set the Count to 10; turn on Cyclic, and make sure the direction is Go From. Click Draw.

When the move is completed, you'll have a map that scrolls off the screen to the right. Now what you need is a second image that scrolls into the space the first image leaves behind.

- Go to frame 1. Move the cursor to the lower left corner of the screen and stamp the brush down off screen.

- Display the Move requester, and click Draw.

At this point you'll see DeluxePaint draw the second map image scrolling into place alongside the first. When the draw operation is finished, you should have a scrolling map.

- Press the 4 key to confirm that you have a scrolling map without any glitches. If it's moving too fast for you, slow it down using the left arrow key.

Now you need to pick up half the scrolling image as an AnimBrush.

- Go to frame 1.
- Press `b` on the keyboard to get the Brush Selector tool and pick up a very small brush (1 pixel square) from anywhere on the screen.

The step above was included for the sole purpose of getting your screen size map brush out of memory. By selecting the smaller brush, you released the large brush from memory. If you are on a 1MB system, and you didn't perform the last step, you probably will get an out of memory message on the next step.

- Choose **Animbrush>Pick Up** from the Anim menu. Select the left half of the image. If you have Coordinates turned on, half the map is exactly 160. Enter 10 in the requester to pick up the left half of your animation as an AnimBrush. Again, use the blue background as a reference for picking up the AnimBrush.

Now you have an AnimBrush of a scrolling map. The trick is to convert that to a ball shape.

- Clear all frames.
- Choose **BeSquare** from the Prefs menu.
- Draw a solid color filled circle in the middle of frame 1. (Make the circle about 3 inches across.)
- Choose **Frames>Copy frames** from the Anim menu and select the All Frames button. This will copy frame 1 to all of the animation frames.
- Right-click on the Fill tool to display the Fill Type requester. Choose Brush as your fill type, and click OK.
- Choose **Animbrush>Use** from the Anim menu. Press `Shift-7` to position your AnimBrush on its first cel.

- Select the Fill tool. Hold down the *Alt* key and click on the center of your solid colored circle.

DeluxePaint will automatically "animfill" to wrap the map image into each of your circles. When it's finished, play the anim to see your spinning globe. All that's left now is to pick it up as an AnimBrush and move it through three dimensions. We'll leave that part up to you. Or if you like, try creating spinning balls with other images, like faces or interesting patterns. Once you've mastered this feature, you'll find it hard to resist.

Tips

This brief section lists some tips for using DeluxePaint's animation features. This is not a complete list of tips, so be sure you at least scan the rest of the manual if you are not inclined to read everything.

- You can use Fixed Background to see the current frame as you modify it for the next frame. This is very useful for freehand animations. Here's how it works:

  Create some animation frames and draw a figure on frame 1. Choose **Background>Fix** from the Effect menu. Choose a different color to paint a modified version of the first figure. Press 2 to step to frame 2. Choose Background Free to stamp the modified figure on frame 2. You can repeat this process to paint the next modification, and so on.

- If you want your brush to grow (move toward the screen) in your animation, but you need to stamp it in the small size for proper positioning, you will get nicer results if you paint the brush large and then use the ' or Ctrl key in Perspective to shrink it before you paint it down for the move. This way the brush moves toward its original large size as it is drawn by the Move requester and the large size will not suffer from "jaggies."

- Because Ease Out and Ease In in the Move requester always affect both the Distance and Angle motions, a falling, tumbling object won't look right — the tumble appears to accelerate along with the fall. Here's a work around: Use Move to make a tumbling object without Ease Out or Ease In. Pick the object up as an AnimBrush. Now use Move to make this AnimBrush fall with Ease-Out for acceleration. The tumble stays at a constant rate, but the fall accelerates!

Similarly, Move can't Ease-Out one Distance parameter and not the other. That means it can't make a cannonball fly at a constant X speed but a decelerating Y speed (to form a parabola). You can overcome this by creating the animation in steps as in the Amazing Bouncing Ball effect: Use Move to paint a ball falling with Ease In. Pick up the falling ball as an AnimBrush. Use Move (or the Straight Line tool with N Total spacing) to paint the falling ball moving across the screen at a constant rate.

- If you want an object to completely disappear when it flies off to infinity, here's a trick: Set the X rotation to 90° so that the brush turns "edge on" as it approaches infinity. This way no more than a single pixel line will remain of your brush.

- When you paint your brush down to begin a move, select Undo immediately after you stamp the brush. This guarantees that the brush appears correctly on the current frame when the move is painted. Painting down your brush before a move is how you tell DeluxePaint where to start the move from. You don't need to leave the paint in place, since DeluxePaint paints that frame again as the first frame of the move.

- You can't stamp the brush behind you, but you can Move it there. If you want an object to start from behind the viewer and drop into the screen with a perfect, unbroken motion, do this: Start from the center position and use the Move requester set to a Count of 1 to move the brush out to the position you want (for example, -1000 from the front of the screen). Now clear the screen or reload the background for the animation. Use the Move requester to move the brush forward enough Z distance to go from behind you past the center position and off into the distance.

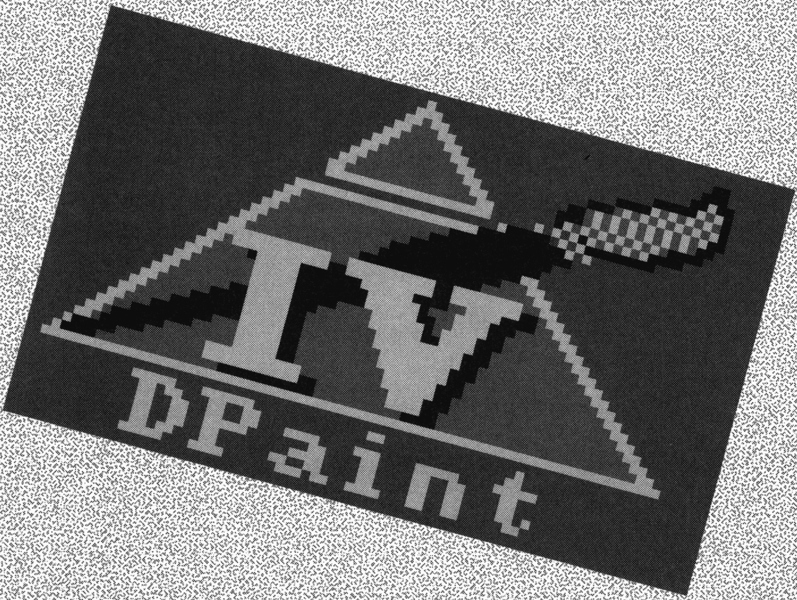
- If you have a series of pictures that use the same screen format and palette, you can use DeluxePaint IV to give a slide show. Just load each picture into a frame (see Load in the Picture menu for loading multiple pictures) and set a slow frame rate or flip the frames manually with the 2 and 1 keys.

- You can calculate the Distance numbers for the Move requester by positioning the brush at each end of the move in Perspective and subtracting the beginning position coordinates from the ending position coordinates. Use the \ key to toggle between angle and position coordinates.

Spacing Tips

When you animpaint with the shape tools, use the Spacing requester to control the number of brush stamps used to draw the shape. In effect, this setting determines how many frames you will paint over.

Instant Marquees: Set the Spacing requester to N Total and the number of frames you have, and animpaint unfilled shapes using a built-in brush. Using the Spacing set to N Total for animpainting is especially good with the Circle tool, which otherwise paints a non-cyclical pattern. Also try setting Spacing to Every Nth Dot, especially with the unfilled Polygon tool.



References

8

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DeluxePaint IV's *Reference* chapter contains all the information you'll need to master the program, arranged in a way that's easy to use. The ***Tools section*** covers the Toolbox, explaining how to select, modify and use the tools to draw basic shapes or otherwise manipulate your image by color, size, shape or orientation. The ***Menus section*** covers all the options available in the pull-down menus. The menus are described individually, moving left to right across the Menu Bar, and down through each option.

Some entries in *Reference* cross-reference other parts of the manual or other sections of *Reference*. We recommend that you look at the cited section for more information about any cross-referenced entry.

Tools

When you start DeluxePaint IV, the Toolbox appears on the right side of the screen. It contains built-in brushes, tools, the Color Indicator, and the Palette.

- Select a tool by clicking its icon in the Toolbox.

You can hide the Toolbox to expose more of the painting area by pressing F10 (this hides the Toolbox and the Menu bar). You can then press F9 to display the Menu Bar *without* the Toolbox. Press F10 to display the Toolbox again.

- Be sure the cursor is not at the top of the screen when you press **F10**.

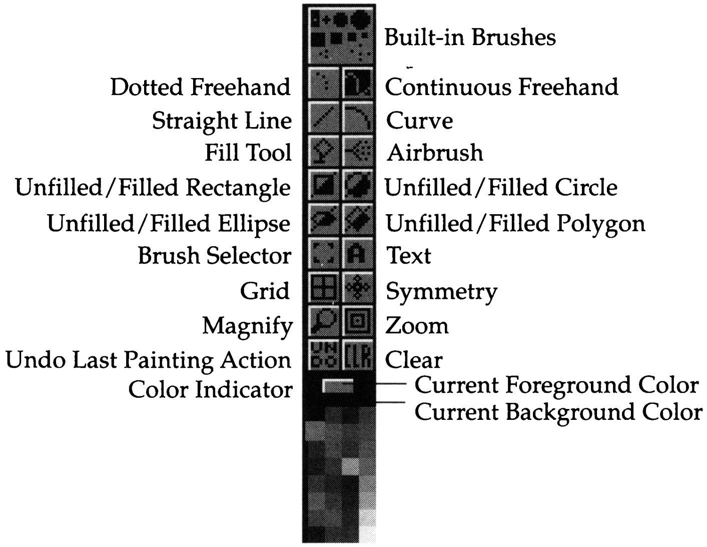

Built-in Brushes
Dotted Freehand
Continuous Freehand
Straight Line
Curve
Fill Tool
Airbrush
Unfilled/Filled Rectangle
Unfilled/Filled Circle
Unfilled/Filled Ellipse
Unfilled/Filled Polygon
Brush Selector
Text
Grid
Symmetry
Magnify
Zoom
Undo Last Painting Action
Clear
Color Indicator
Current Foreground Color
Current Background Color

Figure 8.1 The Toolbox

The following tool descriptions include any keyboard equivalents that are available. And to help you learn these, we have suggested a mnemonic for each one. You'll find these especially useful if you want to hide the Toolbox as explained above. You can also find all keyboard equivalents in ***Appendix B.***

Built-in Brushes

There are ten built-in brushes you can paint with in the Toolbox. To select any built-in brush, click on it.

Right-clicking a brush invokes the resize brush option. When you move the brush to the screen, your cursor will have the word SIZE hanging from it. To increase or decrease the size of the brush, drag the mouse.

You can also change the size of the current brush dynamically, even while you're painting. Press the *plus* (+) key to increase the size of your brush (no need to press the Shift key). Press the *minus* (-) key to decrease its size. The icon in the Toolbox reflects any changes you make.

❖ The smallest a resized built-in brush can be is 1 x 1 pixel. The largest it can be is 100 x 100 pixels.

Dotted Freehand

Keyboard Equivalent: s—mnemonic—sketch

Lets you paint freehand with the current built-in (or custom) brush. Hold down the left mouse button to paint with the foreground color, or the right mouse button to paint with the background color. The tool paints in a series of "splats" or "stamps" of the current brush shape.

The spacing between each stamp depends on how fast you move the mouse—the faster you move the mouse, the greater the spacing between stamps. If you move the mouse slowly, there is no space between splats.

Holding down the *Shift* key while painting constrains the tool to move either horizontally or vertically, depending on the direction you move the cursor immediately after pressing Shift.

Continuous Freehand/ Filled Freehand Shape

Keyboard Equivalent: d—mnemonic—draw.
D—Filled draw

Click in the upper left corner of the icon to select the Continuous Freehand tool. Click in the lower right corner to select the Filled Freehand Shape tool.

The Continuous Freehand tool paints the brush in a continuous line as you drag the mouse. This tool works like the Dotted Freehand tool, except that it never "splats."

Holding down the *Shift* key while painting with the Continuous Freehand tool constrains the tool to move either horizontally or vertically, depending on the direction you move the cursor immediately after pressing Shift.

Use the Filled Freehand Shape tool to draw filled freehand shapes. When you release the mouse button, your shape is filled using the current setting of the Fill Type requester. (If you release the mouse button before you reach the starting point for your filled shape, DeluxePaint completes the shape by drawing a straight line from the current mouse position to the starting point of the shape.)

Holding down *i* as you click on the Filled Freehand Shape tool causes the tool to paint shapes that are filled and then outlined with the current brush using the settings of the Spacing requester. If you use a custom brush as your current brush, it is possible to paint shapes that are filled with one color and outlined with another. The outline is painted by tracing the shape with the current brush. Note that the shape is traced by the brush handle; if the handle is offset from the brush, the outline will be offset from your filled shape.

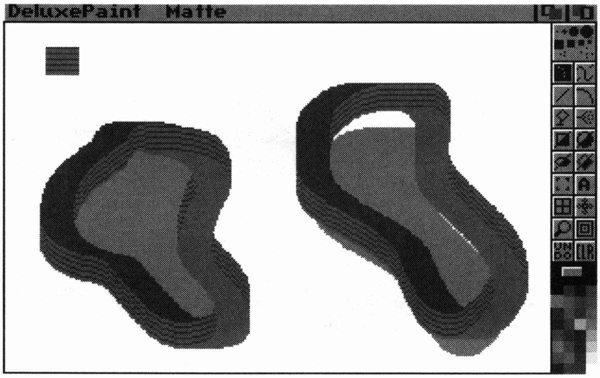


Figure 8.2 Two outlined shapes using a custom brush—one with the handle centered and one with the handle offset from the brush

Right-clicking on the Filled Freehand Shape tool displays the Fill Type requester. From here you can set the fill type for all filled shapes. See *Fill Tool* for an explanation of the options in this requester.

Straight Line Tool

Keyboard Equivalent: v—mnemonic—vector.
V—Spacing requester

Paints a straight line in any direction. The width of the line is determined by the current built-in (or custom) brush. To paint a line:

- ▶ Select the Straight Line tool, and position the cursor where you want the line to begin.
- ▶ Use the left mouse button to paint with the foreground color, or the right mouse button to paint with the background color.
- ▶ Drag in any direction to create a line.

⇧

Holding down the *Shift* key while painting a straight line constrains the line to be either horizontal or vertical, depending on the direction you move the cursor immediately after pressing Shift.

Ctrl

Holding down the *Ctrl* key as you paint a straight line, causes the line to leave "traces" as you paint.

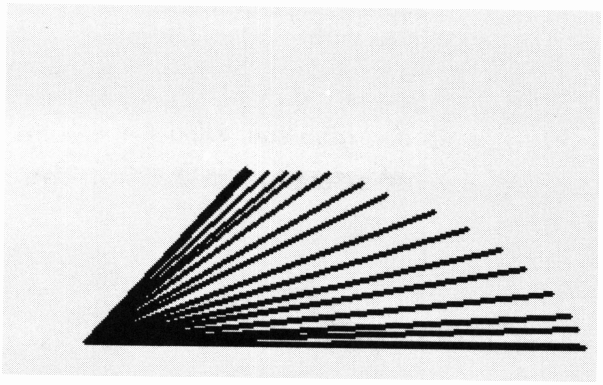
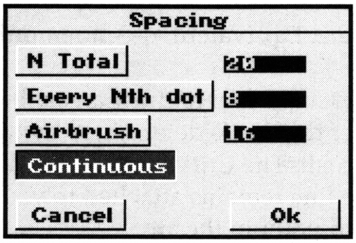


Figure 8.3 Traces drawn with Straight Line tool

Right-clicking the Straight Line tool displays the Spacing requester. The Spacing requester lets you specify the space between the paint "splats" deposited by the brush. Click to choose any of the four options in the requester.



Spacing

N Total 20

Every Nth dot 8

Airbrush 16

Continuous

Cancel

Ok

Figure 8.4
The Spacing requester

N Total

Defines the total number of "splats" that will occur along the line. You can define the number of "splats" by clicking the edit box, backspacing or deleting over the existing value, and typing in the new value. This setting is especially useful for ensuring that when animpainting over a series of frames you get exactly the number of brush stamps you need.

Every Nth dot

Spacing sets the number of pixels between each "splat" of the brush. This lets you space your brush splats accurately.

Airbrush

Paints using the Airbrush tool along the path defined by any tool affected by the Spacing requester. The number to the right of the button sets the number of airbrush sprays to be applied at each pixel along the path. This creates a fuzzy line or shape. You can use this feature with the painting modes from the Modes menu to create interesting effects. For example, using Smear with the Airbrush spacing can create interesting textured effects on a colored background.

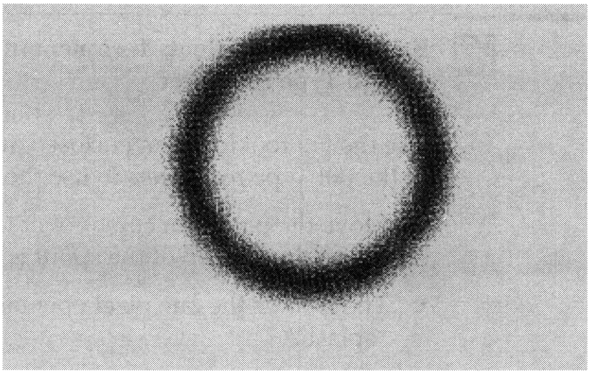


Figure 8.5 Circle painted using Airbrush spacing and the Color painting mode

Continuous

This spacing paints an unbroken path with no space between pixels. Continuous is the default setting.

Curve Tool

Keyboard Equivalent: q—mnemonic—qurve

Use the Curve tool to draw an arc between two points. The width of the line is determined by the current built-in (or custom) brush. The Curve works like the Straight Line tool, except that the line remains attached to your cursor, so you can specify the third point in the arc.

- ▶ Select the Curve tool, and position the cursor where you want the curve to begin.
- ▶ Drag to where you want the curve to end, and release the mouse button.
- ▶ Move the mouse in any direction to form the arc shape you want, and click.

Holding down the *Shift* key while painting with the Curve tool, constrains the tool to move either horizontally or vertically as you paint the initial line, depending on the direction you move the cursor immediately after pressing Shift. This is useful if you want the ends of your curve to line up horizontally or vertically.

Holding down the *Ctrl* key as you paint a curve, causes the curve to leave "traces" as you paint.

Right-clicking the Curve tool displays the Spacing requester (see *Straight Line Tool,* above, for an explanation of the options in this requester).

Fill Tool

Keyboard Equivalent: f—mnemonic—fill.
F—Fill Type requester

Use the Fill tool to fill an enclosed area using the current settings in the Fill Type requester. To use the tool:

- ▶ Move the paint can cursor over the *enclosed* area you want to fill, so that the tip of the spout is within the area.
- ❖ The *spout* is the one pixel opening at the bottom of the "splash."
- ▶ Click to fill the enclosed area.

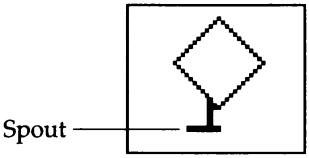


Figure 8.6
The "spout" of the fill cursor

I

Holding down *i* when you click with the Fill cursor, fills outward to the background color. In other words, the fill spreads outward until it reaches areas of the current background color.

Alt

Holding down the *Alt* key when you click with the Fill cursor, animfills the shape. This means that the frames of your animation will flip, and the fill tool will fill outward on each frame from the point where you clicked. This option works with all of the Fill Types except the gradient fills that use the gradient direction line to define the gradient.

Right-clicking the Fill tool displays the Fill Type requester. The options in the requester are explained in the following paragraphs. When you return to the painting screen after choosing a fill type, the current gradient (or pattern, if Pattern or Perspective is selected) and its orientation are shown in the Color Fill box in the Title Bar (see *User Feedback in Title Bar,* later in this chapter).

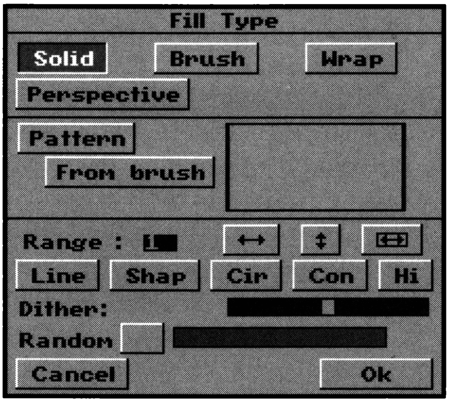


Figure 8.7
The Fill Type requester

Solid

Fills with the current color. If you paint or fill your shape using the left button, the shape is filled with the foreground color. If you paint or fill your shape using the right mouse button, it is filled with the background color. This is the default mode.

Brush

Fills with one image of the current custom brush and sizes it to fit the filled area. See Figure 8.8.

Wrap

Fills with one image of the current custom brush and adjusts it to the horizontal and vertical shape of the filled area. This gives the illusion of wrapping the brush around a 3D solid. The effect is most pronounced if you use it to fill a shape that is very different from the shape of the custom brush. See Figure 8.8.

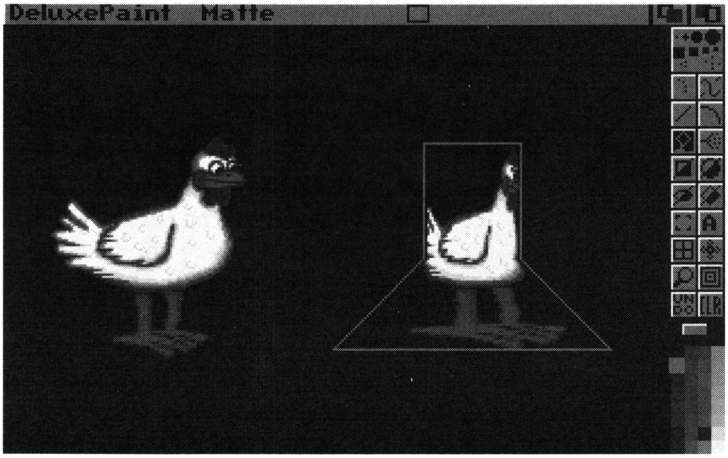


Figure 8.8 Brush and Wrap fills

Perspective

Fills with a pattern of the current brush in the current perspective setting (see **Perspective** under the Effect menu).

HBrite

Fills using the Hbrite painting mode. In effect, this is a special form of tinting that only works if you are working in Halfbrite mode (see **HBrite** in the Mode menu, below). When you are not in Halfbrite mode, this option does not appear in the requester. Drawing with the right mouse button over Halfbrite areas reverts them to their full color counterparts.

Pattern

Fills with a pattern made from a brush. To use this option, you must first click the *From Brush* button to create a pattern of the current brush. This pattern remains the current fill pattern until you click From Brush again to create a new pattern from your new custom brush.

Range

Fills an enclosed object with a spread of colors (a gradient, see *Gradients*, below) from the selected range. Type in the number of the range you want to use. Click to select one of the fill options, which specify the direction and type of the gradient fill. You can only use one fill option at a time.

Horizontal paints the gradient horizontally.

Vertical paints the gradient vertically with an even distribution.

Horizontal Line paints the gradient one line at a time and adjusts the gradient on each line so that it follows the contours of the shape being filled.

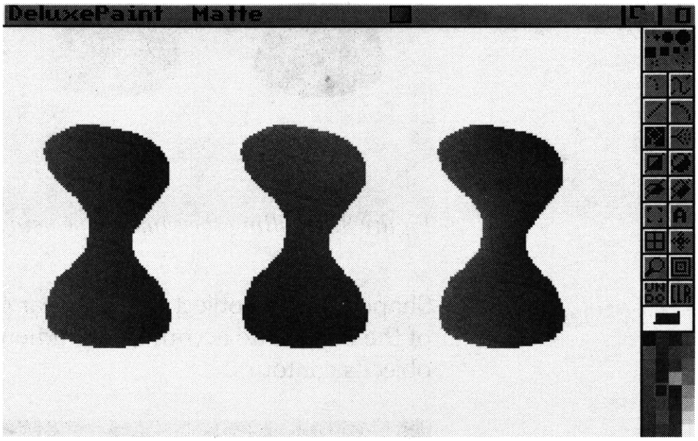


Figure 8.9 Vertical, Horizontal, and Horizontal Line gradient fills

Gradients

DeluxePaint supports two types of gradients: Linear and Radial. A Linear gradient fills an object in one direction (in a line), and can either take the object's shape into account, or ignore it. A Radial gradient fills an object in all directions (radially) from the point where you click, until it reaches the boundaries of the object. Like Linear gradients, a Radial gradient can either take the object's shape into account, or ignore it.

Linear Gradients

The linear gradients are *Line* and *Shap(ed)*. When you fill an object with either of these options, a gradient directional line stretches from the center of the object to the cursor. Use this line to tell DeluxePaint the direction in which to fill the shape with the gradient. For example, if you move the directional line to the top of your shape and click, DeluxePaint fills your shape with the selected gradient from top to bottom. The first color in the gradient (in the far left position in the range) appears at the bottom of the shape.

Line

Line fills the object with a uniform linear gradient, ignoring the shape of the object.

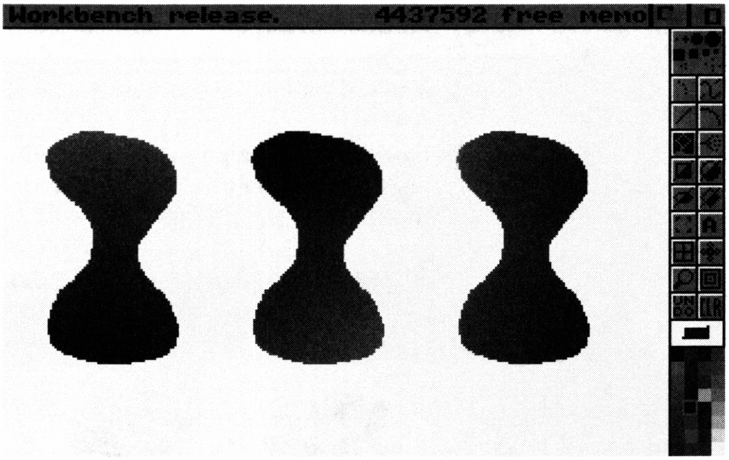


Figure 8.10 Filling the same shape using different gradient directions

Shaped fills the object with a linear gradient, taking the shape of the object into account, so gradient lines tend to follow the object's contours.

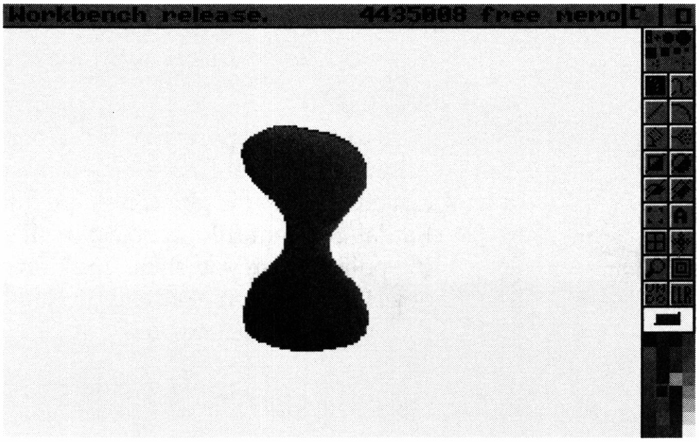


Figure 8.11 Shaped Gradient

Radial Gradients

The radial gradients are *Cir(cular)*, *Con(tours)*, and *(Hi)light*. When you select any of them and click on a shape, a gradient directional line stretches from the center of the object you filled to the cursor. Move the cursor, which is attached to the directional line, to the spot where you want the gradient to begin and click. DeluxePaint will fill your shape radially outward from the point where you clicked. Radial gradients are especially useful for drawing shadows and other consistent three dimensional lighting effects.

Cir Circular fills the object with a circular (shaped) gradient radiating outward from the point where you click. Like the Straight linear fill, above, Circular does not take the shape of the object into account.

Con Contours fills the object with the gradient taking the shape of the object into account. This creates a contour effect, reminiscent of topographical maps.

Hi Highlight is similar to Contours, but optimized to create a highlight effect. Like Contours, the object is filled with its shape taken into account. See Figure. 8.12 for a comparison between the two methods.

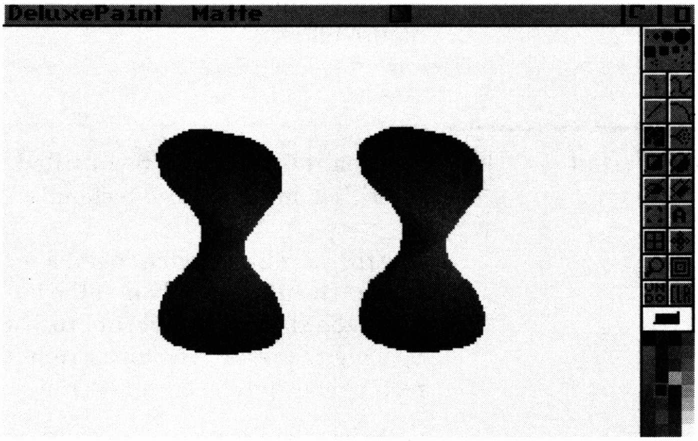


Figure 8.12 Gradient fill, showing the difference between Contours and Highlight

Random

When you click the Random action button, a √ appears. With Random turned on, the border between any two colors in the gradient are randomly mixed (see *Dither*, below). Click the action button a second time to turn off Random.

Dither

DeluxePaint draws patterned gradients by dithering, which reduces the contrast between adjacent colors (without changing the colors themselves). When Random is checked, you can adjust the degree of color mixing in the gradient fill. Drag the Dither slider left or right to decrease or increase the amount of dither. Setting the slider all the way to the left gives almost no mixing between shades. Moving the slider to the right increases the amount of mixing at the color boundaries.

Airbrush Tool

Simulates the action of an airbrush by spraying with the current brush.

- ▶ Select the Airbrush tool. Position the cross-hair on the page and drag to paint.

Holding down the *Shift* key while painting with the Airbrush tool, constrains the tool to move either horizontally or vertically, depending on the direction you move the cursor immediately after pressing Shift.

Right-clicking on the Airbrush tool lets you size its nozzle. After right-clicking the tool, move the cursor onto the page and drag the mouse until the nozzle is the size you want, then release the mouse button.

Unfilled/Filled Rectangle

Keyboard Equivalent: r—unfilled.
R—filled; mnemonic— rectangle

Use the Rectangle tool to paint a rectangle shape using any brush. The upper left half of the tool paints a rectangle outline using the size of the current brush and the current settings of the Spacing requester. The lower right half of the tool paints a filled rectangle using the current settings of the Fill Type requester.

- ▶ Select the Rectangle tool, and position the cursor on the page where you want the rectangle to begin.
- ▶ Drag the cursor diagonally to form a rectangle. When the rectangle is the size you want, release the mouse button.

Holding down the *Shift* key while painting with the Rectangle tool, constrains the rectangle to be the same number of pixels wide and high. You'll notice that this shape is not necesarily a square. This is because the pixels in the Amiga display are not square. To paint a square, turn on the **Be Square** option in the Prefs menu. When **Be Square** is on, DeluxePaint IV adjusts the height and width of your square so that it appears square rather than being square in terms of pixel count.

Holding down the *Ctrl* key as you paint a rectangle, causes the rectangle to leave "traces" as you paint.

Holding down *i* as you click on the Filled Rectangle tool causes the tool to paint shapes that are filled and then outlined with the current brush using the settings of the Spacing requester. (See *Freehand Shape Tool* for more information.)

Right-clicking on the Unfilled Rectangle tool displays the Spacing requester. Use this requester to set the spacing between "splats" in the sides of your rectangle. (See *Straight Line Tool,* above.)

Right-clicking on the Filled Rectangle tool displays the Fill Type requester. Use this requester to set the type of fill you want in your rectangle. See *Fill Tool* for an explanation of the options in this requester.

Unfilled/Filled Circle

Keyboard Equivalent: c—unfilled.
C—filled; mnemonic—circle

Use the Circle tool to paint circles using any brush. The upper left half of the tool paints a circle outline using the current brush and the current settings of the Spacing requester. The lower right half of the tool paints a filled circle using the current settings of the Fill Type Requester.

- Select the Circle tool, and position the cursor on the page where you want the center of the circle.
- Drag the cursor in any direction to form the circle. When the circle is the size you want, release the mouse button.

The circles that DeluxePaint IV paints may not appear perfectly circular. Circles are painted to be the same number of pixels high as they are wide. The circles do not appear perfectly circular because the pixels of the Amiga display are not square. If you want your circles to appear circular, turn on the **Be Square** option in the Prefs menu (see *Prefs Menu,* below).

Holding down the *Ctrl* key as you paint a circle, causes the circle to leave "traces" as you paint.

Holding down *i* as you click on the Filled Circle tool causes the tool to paint shapes that are filled and then outlined with the current brush using the settings of the Spacing requester. (See *Freehand Shape Tool* for more information).

Right-clicking on the Unfilled Circle tool displays the Spacing requester. Use this requester to set the spacing between "splats" in the sides of your circle. (See *Straight Line Tool,* above.)

Right-clicking on the Filled Circle tool displays the Fill Type requester. Use this requester to set the type of fill you want in your circle. See *Fill Tool* for an explanation of the options in this requester.

Unfilled/Filled Ellipse

Keyboard Equivalent: e—unfilled.
E—filled; mnemonic—ellipse

Use the Ellipse tool to paint an ellipse. The width and shape of the line is determined by the current brush. The upper left half of the tool paints an ellipse outline using the current settings of the Spacing requester. The lower right half of the tool paints a filled ellipse using the current setting of the Fill Type requester.

- ▶ Select the Ellipse tool. Position the cursor where you want the center of the ellipse to be and click.
- ▶ Move the cursor in any direction to form the shape you want.
- ▶ Drag the mouse in a circular motion to rotate the ellipse. The degree of rotation is shown in the menu bar.
- ▶ When the ellipse is positioned in the orientation you want, release the mouse button.

Holding down the *Ctrl* key as you paint an ellipse, causes the ellipse to leave "traces" as you paint.

Holding down *i* as you click on the Filled Ellipse tool causes the tool to paint shapes that are filled and then outlined with the current brush using the settings of the Spacing requester. (See *Freehand Shape Tool* for more information.)

Right-clicking on the Unfilled Ellipse tool displays the Spacing requester. Use this requester to set the spacing between "splats" in the sides of your ellipse. (See *Straight Line Tool,* above.)

Right-clicking on the Filled Ellipse tool displays the Fill Type requester. Use this requester to set the type of fill you want in your ellipse. See *Fill Tool* for an explanation of the options in this requester.

Unfilled/Filled Polygon

Use the Polygon tool to paint a polygon shape using any brush. The upper left half of the tool paints a polygon outline using the current settings of the Spacing requester. The lower right half of the tool paints a filled polygon using the current settings of the Fill Type requester.

- ▶ Select the Polygon tool, and position the cursor where you want one of the corners of the polygon.
- ▶ Click and then move the mouse in any direction to pull out a side of the polygon.
- ▶ Click to tack down each corner of the polygon. Clicking on the Polygon's point of origin completes it.
- ❖ You can complete a polygon without having to search for the point of origin by pressing the *space bar*. This automatically completes the polygon by connecting your last corner with the origin. However, if you're using the Unfilled Polygon tool, pressing the *space bar* will not complete the polygon. You'll need to connect the last corner with the point of origin yourself.

Ctrl

Holding down the *Ctrl* key as you paint a polygon, causes the polygon sides to leave "traces" as you paint.

Holding down *i* as you click on the Filled Polygon tool causes the tool to paint shapes that are filled and then outlined with the current brush using the settings of the Spacing requester. (See *Freehand Shape Tool* for more information.)

Right-clicking on the Unfilled Polygon tool displays the Spacing requester. Use this requester to set the spacing between "splats" in the sides of your polygon. (See *Straight Line Tool,* above).

Right-clicking on the Filled Polygon tool displays the Fill Type requester. Use this requester to set the type of fill you want in your polygon. See *Fill Tool* for an explanation of the options in this requester.

Brush Selector

Keyboard Equivalent: b—new brush.
B—previous brush; mnemonic—brush

Use the Brush Selector to create a custom brush from any image on the page, or to recall your most recent custom brush.

To select a *rectangular* brush:

- ▶ Select the Brush Selector, and move the cursor to the page, where it becomes a large cross-hair.
- ▶ Drag diagonally to enclose the area you want to use as a brush. Release the mouse button to select it.

To select a *polygonal* brush:

- ▶ Double-click the Brush Selector to select it. The Brush Selector icon now looks like the Polygon tool.

  You can now surround the area you want to pick up as a brush as though you were drawing with the Polygon tool. As with the Polygon tool, pressing the *space bar* completes the brush selection automatically.

- ❖ Using the left mouse button to pick up a brush simply copies the selected area as a brush. Using the right button to select the brush cuts the selected area from the page to make the brush, and replaces the area with the current background color.

When you pick up a brush, any colors that match the current background color are transparent. If you have **AutoTransp** turned on in the Prefs menu, this additional rule applies: if all corners of the brush are of the same color, that color becomes transparent, regardless of whether it is the background color. (See **AutoTransp** in the Prefs menu).

You can retrieve your most recent custom brush or AnimBrush by right-clicking the Brush Selector or pressing B.

Holding down the *Shift* key while selecting a brush with the rectangular Brush Selector will constrain the brush to be a square. This means that it will be the same number of pixels high as it is wide. Because the pixels of the Amiga display are not square, your brush may not appear square. If you want the brush to appear square, turn on **Be Square** in the Prefs menu before you select the brush.

Text

Keyboard Equivalent: t—mnemonic—text. T—text requester

Use the Text tool to add text to your picture.

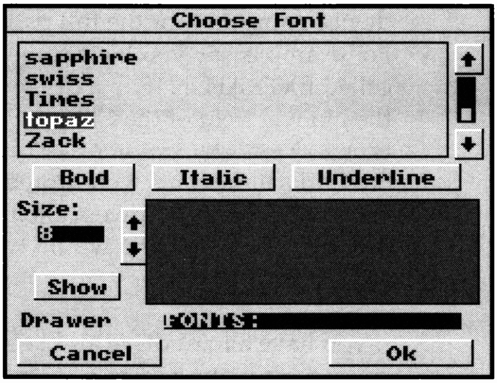
- ▶ Select the Text tool, and move the cursor to the page.
- ▶ Click to place the text cursor. Type on the keyboard to enter text in the current foreground color.

The text will automatically wrap around the right edge of the page and restart below the original cursor position. If your page size is larger than the screen, the page scrolls as you type off the edge of the screen. The text tool does not automatically word-wrap like a word processor.

You can use the Backspace key to erase text, and the Return key to begin a new line. To exit text mode, press ESC or click a painting tool.

❖ You cannot backspace over typed characters if the screen scrolls.

Right-clicking the Text Tool displays the Choose Font requester. Use this requester to choose fonts, sizes, and styles for your text.



Size: 8

Drawer FONTS:

Figure 8. 13 The Choose Font requester

The scrolling font list displays the fonts that are available in the current font directory. To choose a font, click on its name. By default this directory is specified as FONTS:.

By clicking in the Drawer edit box, typing a new disk directory path name and hitting *Return*, you can specify a new disk drawer for fonts. This makes it much easier to access fonts from directories other than FONTS. For example, to use the fonts on the Art disk, you would type `Art1:Karafonts` in the Drawer edit box and press *Return*.

Choose a size for the font by clicking on the up and down arrows next to the size edit box. The scrolling list of sizes is restricted to the currently available sizes for the font that you have chosen.

Choose a style for the font by clicking on the Bold, Italic, and Underline action buttons. You can use these styles in any combination. Clicking an active (highlighted) button turns it off. The two fonts included on the Art2 disk have only one size available for each.

Clicking the Show button loads the currently selected font from disk and displays a sample of the current font in the show window of the requester.

Some fonts are CAPS only fonts, so if you are typing and all you see is an outline, turn on the Caps Lock key and try again.

Font Tips **To Load and Assign Fonts from other Disks or Directories:**

1. Make sure that you know the correct disk name or storage device name and/or the full path name of the fonts location. For example, say you have some video fonts stored on a disk called EXTRAFONTS in a drawer called FORVIDEO, then in the Drawer field of the Choose Font Requester you would type `EXTRAFONTS:FORVIDEO` and press the Return key. Similarly, if the fonts were stored on a hard drive partition called dh0 in a subdrawer called FONTS1 under a drawer called PAINT, then you would type `dh0:PAINT/FONTS1` in the Choose Font requester.

2. If you have a hard drive and keep your fonts in several drawers or in drawers a couple of levels deep, you may want to add assigns to your startup-sequence so that you can access your font collection quickly in the Font requester. Please consult your Amiga owners manual or Amiga DOS manual on how to edit your startup sequence before you experiment with this. Following is an example of an assign you can use to access the two ColorFonts included on the ART1 disk. The assign to access the fonts would be:

   ```
   ASSIGN KARA: dh0:DpaintIV/Karafonts
   ```

   After this Assign has been executed, rather than having to type in dh0:DpaintIV/Karafonts in the drawer field, you will need to type only `KARA:` and the system will automatically take you to the Karafonts subdirectory. This example assumes you have installed the Karafonts drawer from your ART1 disk into your DPaintIV drawer on your hard drive.

   This example can be used widely for other font drawers as well. In the LOAD & SAVE requesters throughout the program Assigns can also be quite useful for saving and loading Pictures, Brushes, AnimBrushes, and Animations to long path names.

3. Please note that not all font sets have complete attributes, some fonts may not be able to be Italicized or Underlined; most fonts should be able to be set to Bold.

4. DeluxePaint IV is compatible with most Standard Amiga Fonts, and can also load ColorFonts of up to 16 colors. Your Amiga dealer, local Amiga Users Group, or Amiga magazines are good sources for obtaining Public Domain fonts or for Purchasing additional commercial fonts like the KaraFonts included with DeluxePaint IV.

Grid

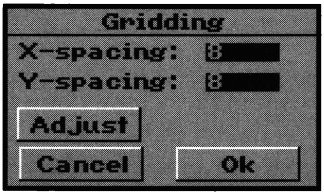
Keyboard Equivalents: g—grid on/off; Shift-g—grid on and use brush handle location as a grid point; mnemonic— grid

The Grid constrains some of the painting tools so that they paint *only* on the coordinates of a grid. If you press G to turn the grid on while using a brush, the grid will use the current brush handle position as one of its grid points.

The tools affected by the grid are:

Dotted Freehand
Straight Line
Rectangle
Circle
Ellipse
Brush Selector
Text

Right-clicking the Grid icon displays the Gridding requester. Use this requester to adjust the x and y spacing of the grid.



Gridding
X-spacing: 8
Y-spacing: 8

Figure 8.14
The Gridding requester

You can specify the grid values in pixels by deleting or backspacing over the existing values and typing in the new ones. Alternatively, you can click Adjust, which lets you visually place and adjust the grid cursor on the work area. The upper left corner of the adjustable grid is anchored as you drag the lower right corner. Release the mouse button to complete the adjustment.

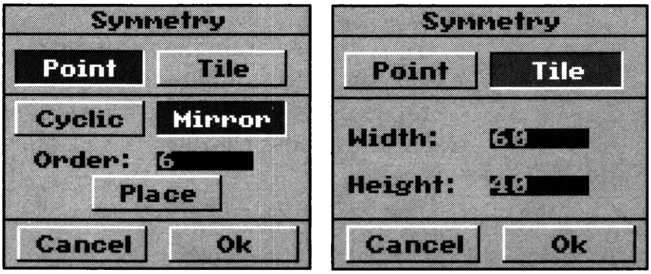
Right-clicking the Grid tool while you are in Perspective mode displays the Perspective Settings requester. See **Perspective> Settings** under the Effect menu .

Symmetry

Keyboard Equivalent: /

The Symmetry tool helps you paint symmetrical patterns around a central point or based on a tiling scheme. Symmetry works with all tools except Text and Brush Selector.

Right-clicking the Symmetry tool displays the Symmetry requester. Use this requester to choose between the two symmetry modes (Point and Tile) and to set parameters for each of the modes.



Order: 6

Figure 8.15 The Symmetry requester in both Point and Tile settings

Point Symmetry

Works around a central symmetry point in either Mirror (mirror image duplication of each point) or Cyclic (direct duplication at each symmetry point). In Point Symmetry you can select the number of symmetry points by using the Order edit box. You can also set the location of the symmetry center by clicking Place and then the point on the screen where you want the center of symmetry to be.

Place

Lets you position the central point of your symmetrical pattern. To reposition the central point, click Place, move the large crosshair to the new location, and click. Subsequent symmetrical drawing will be centered on the new location.

Tile Symmetry

Creates "tile" patterns. You can set the horizontal and vertical dimensions (in pixels) of the tile in the width and height edit boxes (Tile Symmetry requester only). Tile is useful in creating fill patterns; once you've created your symmetrical pattern, set the Grid to the same spacing as the tiles to pick up exactly one tile as a brush. Tile lets you create an entire pattern just by drawing one of its elements, and is an ideal tool for textile designers.

❖ Because Tile Symmetry gives immediate feedback as you draw, it replaces the picture beneath each of the tiles in the symmetry. This will effectively destroy any picture that was on the screen before you turned on Tile Symmetry.

If you want to use Tile Symmetry to paint over an existing picture, choose **Background>Fix** from the Effect menu before you turn on Tile Symmetry. This will protect your existing picture from any inadvertent alteration.

Magnify

Keyboard Equivalent: m—mnemonic—magnify

The Magnify tool divides the screen into two parts and displays the right-hand side in magnification. This tool is especially useful for detail work. When you are in Magnify mode, you can use any other tool on either side of the screen.

▶ Select the Magnify tool. Position the Magnify box over the part of the image you want to enlarge and click with either button.

This divides the screen into two parts, with the right part magnified. You can scroll the magnification window using the arrow keys or the **n** key, which centers the area under the cursor.

To change the magnification scale click the Zoom icon (beside the Magnify tool). Clicking Zoom enlarges the magnified area; right-clicking shrinks it.

❖ You can set the Zoom level before you magnify an area. Changing the Zoom setting will change the size of the rectangle attached to your cursor when you are in the process of magnifying an area,

The Magnify tool is especially useful for detailed work. You can use any other tool on either side of the screen in Magnify mode.

Zoom

Keyboard Equivalent: > enlarge; < shrink

Changes the scale in Magnify Mode (see *Magnify Tool,* above). Click the Zoom tool to enlarge the image; right-click to shrink the image.

Undo

Keyboard Equivalent: u—mnemonic—undo

Reverses the lastest painting action (including UNDO) as long as there has not been an intervening mouse click or a refresh of the screen such as that caused by pressing F9 or F10 to hide or show the menu and toolbox.

CLR

Keyboard Equivalent: K—mnemonic—Klear

Clears (erases) the screen to the current background color. If you have multiple frames, an Options requester appears for you to indicate which frames you want to clear.

Color Indicator

Indicates the current foreground and background colors.

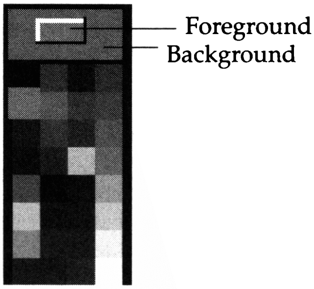


Figure 8.16 The color indicator

Clicking the Color Indicator (or pressing the comma "," from the keyboard) selects the eye dropper cursor. This lets you select a new foreground or background color by clicking a color on-screen. Click the on-screen color to select a new foreground color, or right-click to select a new background color.

Right-clicking the Color Indicator displays the Mixer. Use the Mixer to arrange, modify, and mix colors for your palette.

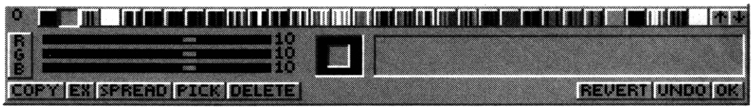


Figure 8. 17 Color Mixer

DeluxePaint IV lets you modify colors with either the RGB or the HSV color mixing systems. See **Palette** under the Color Menu, below for a detailed description of the Mixer.

Palette

Clicking a color in the palette selects that color. Click to select a new foreground color and right-click to select a new background color.

You can scroll through the colors in the palette to select a foreground color by pressing the **[** and **]** keys on the keyboard. Shift-**[** and Shift-**]** to scroll through and select a background color.

◀a▶ In HAM mode an indicator appears below the palette to show which area of the Color Set you are viewing. Click the arrows to move forward or backward. Shift-click to move to the beginning or end.

To *change* the colors in your palette, use the **Palette** and/or **Color Set** options from the Color menu.

Menus

DeluxePaint menus work just like standard Amiga menus.

- ☐ Point to the Title Bar and press the right mouse button to display the Menu Bar.
- ☐ Point to a menu name to open that menu.
- ☐ Drag the pointer down to one of the menu options, and release the mouse button to select that option.

Some menu options have submenus indicated by a right pointing triangle (▶) to the right of the option. You can drag the highlight down to the option to display the submenu, then drag the highlight to the right and down again to select an option from the submenu.

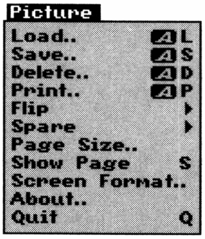
When we reference a submenu option in this manual, we use the following convention: "Choose menu option>submenu option from the X menu." So, for example, "choose **Spare>Swap** from the Picture menu," means display the Picture menu and highlight **Spare**. This exposes the Spare submenu. From the submenu highlight **Swap** and release the mouse button to activate your command.

In many cases, you can select a menu item by using its keyboard equivalent. A table of keyboard equivalents is included as ***Appendix B*** at the back of this manual. Before you use a keyboard equivalent, make sure the cursor is not pointing at the Title Bar, or your keystroke will have no effect.

❖ One keyboard equivalent deserves special mention: **a**, the "Again" key invokes your last menu command, whatever it may have been.

The menus are discussed below in the order they are displayed, reading from left to right, across the Menu Bar.

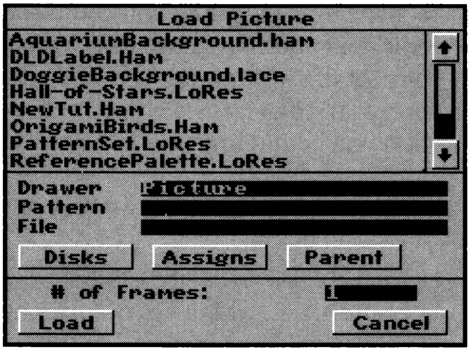
Picture Menu



The Picture menu lets you save, load, and print your pictures, as well as allowing you to make various global changes to the color palette, screen resolution, and page format.

Load ...

Keyboard Equivalent: Right-Amiga- l
Displays the Load Picture requester.



Load Picture

AquariumBackground.ham
DLDLabel.Ham
DoggieBackground.lace
Hall-of-Stars.LoRes
NewTut.Ham
OrigamiBirds.Ham
PatternSet.LoRes
ReferencePalette.LoRes

Drawer Picture
Pattern
File

# of Frames: 1

Figure 8.18 Load Picture requester

Clicking the Disks action button displays the currently loaded disks, devices (for example DFH: or DF0:, DF1:), and volumes (DPaint IV, RAM DISK: , etc.). Clicking the Parent action button moves you into the parent directory in which the current subdirectory resides. This may or may not be the root directory. If you click a drawer [subdirectory] name you will see all the files in that subdirectory.

If you swap disks while this requester is displayed, DeluxePaint reads the new disk's directory but does not display it until you click the Disks button.

If there are more items in the directory than there is room in the window, you can scroll through the window by clicking the up and down arrow keys, or by dragging the scroll box up and down.

Note that devices, volumes and directories are shown in the requester in blue type, while files are shown in black type. Also, devices, volumes and directories are denoted with the prefixes DEV, VOL, and DIR respectively.

Pattern Edit Field

This is a new field in the Load, Save, and Delete Requesters. When used with the proper pattern matching parameters, it lets you selectively view the files you want. You may have noticed that there are two types of 3 character extension patterns that were used for files in the Picture drawer of the Art1 disk, Filename.LoRes, and Filename.Ham. For example, if you only wanted to look at the filenames that end with .LoRes, you would type #?.LoRes. Your file window would show you only the files that end in .LoRes. A good practical example of how this could be used is for the loading of a sequence of pictures as an animation. If your sequence of Pictures were numbered sequentially or alphabetically, and started with the word Space and ended with a .ham extension then you could type Space#?.ham in the Pattern edit field and only those files would be viewable. Select the first file, set the # of frames (see below for a more complete explanation of the # of frames edit box) click on load, and your animation will be put together automatically for you.

The recognized pattern parameters for this edit field are:

?	Matches single characters.
#<pattern>	Matches occurrences of <pattern>

Examples:

#?	shows all files
#?A#?	shows all files whose name contains the letter A.
AN#?	shows all files that begin with the letters AN.
AN#?.???	shows all files that begin with the letters AN and end with a period followed by a 3 character extension.
#?.ANIM	shows all files that end with a .ANIM extension.

ASSIGNS Action Button

The ASSIGNS button, when clicked, shows you the current assigns for your system. They are denoted as <ASN> in the file window, and are blue in color in all but 2 color modes. This function is beneficial to users with large storage devices, such as hard disks, removable media, etc. You can create assigns to go directly into deep levels of subdirectories. For example, if you are working on a job for XYZ company and your image files are 5 drawer levels down from your workbench, it will get cumbersome clicking through subdirectory after subdirectory to get down to the images drawer. By placing an assign command in the startup-sequence of your boot drive, you can avoid this. Please consult your Amiga owner's manual or an Amiga DOS manual for more information regarding editing your startup sequence. The assign command for the example given above might look like this:

```
ASSIGN Images: dh0:Graphics/Paint/Jobs/XYZ-CO/
Images
```

Now from within the program rather than clicking down the 5 levels of drawers you could click the Assigns button and then click on <ASN> Images: and you are taken directly to the subdirectory Images.

Loading a File

Click the file you want to load, and then click the Load button to load the selected file. *Or, if you prefer, you can now simply double-click on the filename to load the file.* Pictures load with all their attributes: palettes, stencils, and perspective information. Click Cancel if you don't want to load a file.

When you load a picture, the loaded picture replaces any existing picture. If you have multiple frames, the loaded picture replaces the current frame.

The **# of Frames** edit box near the bottom of the requester lets you load multiple pictures at one time, as frames of an animation. The pictures must all be in the same format. If you already have animation frames, those frames are discarded and DeluxePaint creates new frames as you load.

- ❖ If you want to *add* pictures to your animation without discarding it, you must load the pictures one at a time.

DeluxePaint loads the pictures starting with the picture you selected in the requester and continuing alphabetically down the listing to load the number of frames you requested. If any of the files in the list is an animation, DeluxePaint loads the first frame of that animation as an animation frame in the new animation. The newly assembled animation uses the palette of the first picture loaded.

Tip If you plan to load a series of pictures with different palettes, build an image that contains a common palette of the most important colors to be preserved in the pictures you load. Load this image as the first in the series to set the palette to which the other pictures will be remapped. Once the animation has been built, you can delete the first picture.

Save ...

Keyboard Equivalent: Right-Amiga-s
Displays the Save Picture requester. This requester works like the Load Picture requester, except that it saves the file to disk rather than loading it.

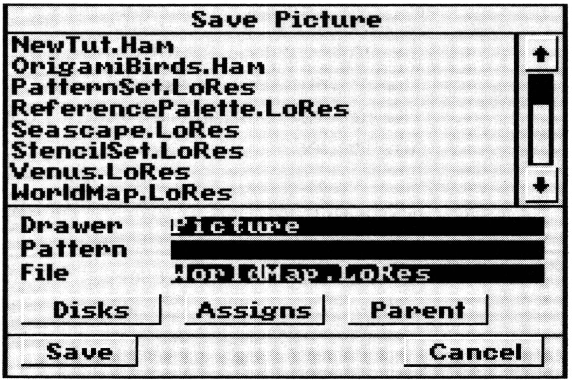
To save a picture from the requester, click on the disk name you want to save to. Click on the subdirectory you want to save your picture in. (Both the disk drive and directory you selected appear in the Drawer edit box, for example DF0:Art). Click in the File edit box and type a name for your picture. Finally, click Save to save the file.

You can save in a particular subdirectory by clicking in the Drawer edit box and typing in the subdirectory name, or by clicking the subdirectory name directly from the file names displayed in the window.

When you type in either the Drawer or File edit boxes, you can erase the existing type by clicking at the end of the existing name and backspacing, or by clicking at the beginning of the name and Deleting. You can move over the text without deleting it by using the arrow keys.

You can save a picture under an existing file name by clicking that file name in the file listing, or you can enter a new file name (up to 29 characters long) by clicking the File edit box and typing the name. Whenever you save a picture under an existing name, DeluxePaint displays a requester for you to confirm that you want to overwrite the existing file.

Pictures are saved and reloaded with all their attributes, such as palettes, stencils and perspective information.



Save Picture

NewTut.Ham
OrigamiBirds.Ham
PatternSet.LoRes
ReferencePalette.LoRes
Seascape.LoRes
StencilSet.LoRes
Venus.LoRes
WorldMap.LoRes

Drawer Picture
Pattern
File WorldMap.LoRes

Figure 8. 19 Save Picture requester

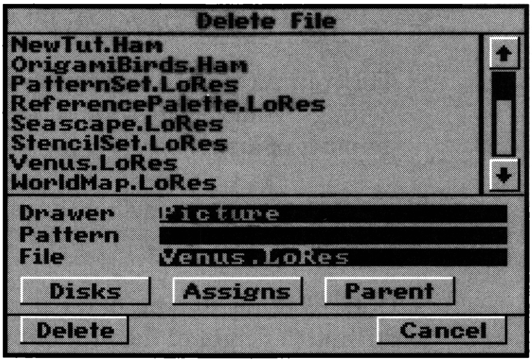
If you have multiple frames when you display the Save Picture requester, the bottom portion of the requester will contain Frames edit boxes for you to specify which frames of your animation you want to save. You enter a file name and specify a drawer just as you would when saving a single picture. When you click Save, the frames are saved as separate pictures with a number added to the end of the file name. For example, if you enter 5 to 10 as the frames you want to save, the frames are saved as Filename005 through Filename 010.

The Pattern edit box and Assigns action button work just as they do in the Load Picture requester (see **Load**, above).

Delete ...

Keyboard Equivalent: Right-Amiga-d
Displays the Delete File requester, which lets you delete a file from the disk without leaving the program. This is especially useful if you find that your data disk is full and you need to delete a file before you can save your work. The Delete File requester works just like the Load and Save requesters described above. You can enter a file name by clicking that name in the requester window, or by typing the name directly into the File edit box.

- ❖ You can use this option to delete *any* kind of file on the disk, not just pictures. Thus, you can delete brushes, animations, etc.


Delete File
Disks
Assigns
Parent
Delete
Cancel

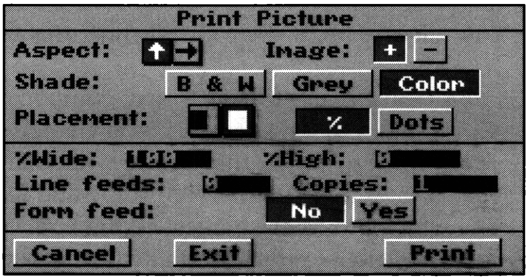
NewTut.Ham
OrigamiBirds.Ham
PatternSet.LoRes
ReferencePalette.LoRes
Seascape.LoRes
StencilSet.LoRes
Venus.LoRes
WorldMap.LoRes

Drawer: Picture
Pattern:
File: Venus.LoRes

Figure 8.20 Delete File requester

Print ...

Keyboard Equivalent: Right-Amiga-p
Displays the Print Picture requester. Before you start to print a picture, make sure you have selected the correct printer driver from **Preferences**, and that your printer is connected and turned on. See your Amiga Users Guide for information on Printer Preferences.


Print Picture
Aspect:
Image: + –
Shade: B & W Grey Color
Placement:
% Dots
Form feed: No Yes
Cancel
Exit
Print

%Wide: 100
%High: 0
Line feeds: 0
Copies: 1

Figure 8.21 Print Picture requester

The Print Picture requester provides the following options:

Aspect: Specifies the orientation of the picture on the paper, either Normal, the default, or Sideways. Click the Up-arrow button for Normal or the Right-arrow button for Sideways.

Image: Specifies whether the printout will be a positive or negative image. Click the Plus button for positive or the Minus button for negative.

Shade: Specifies whether the printout will be in color, in shades of gray, or in black and white. Make sure the setting is appropriate for your printer. If you are using a single-color ribbon, click B & W. If you want to translate your image's colors into shades of gray, use the Gray setting. To print in full color, click Color.

❖ For your picture to print out correctly in the B&W or Gray settings, your palette should contain black, white, and a number of grays.

Placement: Specifies whether the picture should be printed against the left margin of the page or centered on the page.

%/Dots: Controls the size of the printout by specifying the % width and % height of the printout paper. The **Dots** option lets you specify the size of the printout in terms of the actual printer pixels.

If the % option is active then the following parameters can be specified:

% Wide and % High: These let you change the aspect ratio (the ratio of height to width) of the picture by setting the percentages for each. The default values are 100% Wide and 0% High. 0% is a special case and tells the printer to maintain the same aspect ratio as the screen version of the picture. To change the aspect ratio, leave the % Wide at 100 and enter a new % High value.

You can use this feature to compensate for elongated squares and circles that result when you change screen formats. If you just want to shrink the picture while maintaining the same aspect ratio, change the % Wide value and leave the % High value at 0. To change either value, click the appropriate gadget, Backspace or Delete over the existing value, and type in the new one.

If the Dots option is active you can set only the printout width and height in dots.

Line Feeds: Specifies the number of line feeds you want to insert after a picture is printed. This way you can easily print two pictures on the same page with a specified amount of space in between the pictures.

Copies: Specifies how many copies of the picture you want printed.

Form Feed: Lets you set whether or not you want the printer to move to the next sheet of paper before printing each image. This lets you easily print a single picture per sheet of paper.

Cancel if don't want to print and don't want to save any new settings. Click **Exit** if you don't want to print, but want to save your settings to print later. Click **Print** to print the current picture, or once you start printing, you can stop at any time by pressing the Stop button that appears while printing is in progress.

❖ If you wish to Abort a print request before it is complete. Take your printer off-line *before* you click the Abort button.

Flip ▶

Flip lets you flip a picture about its X or Y axis. If you have multiple frames, you can flip one frame, a range of frames, or all frames of your animation. The submenu offers two ways to flip an image, horizontally or vertically.

Horiz
Flips the current picture about the horizontal or X axis.

Vert
Flips the current picture about the vertical or Y axis.

Spare ▶

The Spare option presents a submenu with options for manipulating DeluxePaint's spare page.

Swap

Keyboard Equivalent: j
Conceals the current page and displays a second or "spare" page. This means you have two pages to work on. The concealed page is always the spare page.

When you first select the spare page, it is the standard screen size. If you wish to use a larger page size on the spare page, you'll need to make the appropriate selection from the **Page Size** option (see below). Note, however, that you can increase the size of a page only if you have sufficient memory available. Note also that a spare page uses up memory, even if there is nothing on it.

Copy to Spare

Keyboard Equivalent: Ctrl-j
Copies the picture on the current page to the spare page so you can experiment with your picture on the spare page without fear of losing anything. If you do not have sufficient memory for a spare page, save the image to disk if you wish to experiment with it. If you copy to the spare from a page that is larger than the spare, only the visible portion of the page is copied. If you copy to a spare which is larger than the screen, a copy is made to the spare at the location in the spare that was visible when you last viewed it.

Merge in Front

Merges the spare page in front of the current page. When the spare page is brought forward, all pixels matching its current background color will appear transparent, allowing images on the current page to show through. You must be viewing the page you want to merge to when you choose this option.

Merge in Back

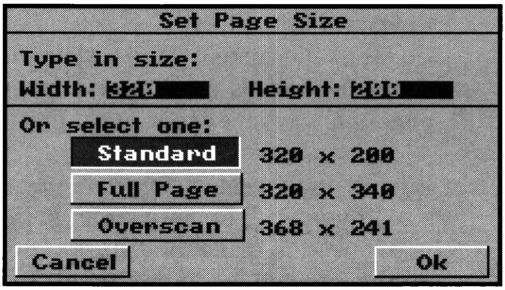
Merges the spare page in back of the current page. When the spare page is put behind the current one, all pixels which match the current page's background color will appear transparent, allowing images on the spare page to show through. You must be viewing the page you want to merge to when you choose this option.

Delete This Page

If you no longer wish to have memory allocated for a second "spare" page, use this option to delete the current page (the one currently showing on the screen) and to deallocate the memory set aside for it. Be sure you have saved a copy of the picture you are deleting if you think you may need it later. When you select Delete this Page, DeluxePaint asks you to confirm the deletion, and then switches you to the other page.

Page Size ...

Displays the Page Size requester. Select the page size (in pixels) you wish to work on. Standard is the normal Amiga display size for the selected resolution.



Set Page Size

Type in size:
Width: 320 Height: 200

Or select one:
Standard 320 x 200
Full Page 320 x 340
Overscan 368 x 241

Figure 8. 22 Set Page Size requester

Full Page gives you a full printed page image (8 1/2 by 11 inches) on most printers. Overscan presents a full-screen display, which lets you create pictures that fill the entire screen. This is particularly useful if you wish to videotape your images. In order to paint on the edges of a full video screen, you need to scroll the image around using the cursor keys or the **n** key unless you set the screen format to Overscan (see **Screen Format**, below). Alternatively, you can view the entire screen by selecting **Show Page,** below.

Clicking one of the three settings automatically sets the height and width in the corresponding edit boxes. You can also type in any other size you wish by clicking the appropriate edit field, Backspacing or Deleting over the existing value, and typing in the new size. Although DeluxePaint will recognize page sizes up to 1008 x 1024, you would need to reduce the number of colors in your palette to create a picture this large.

Show Page

Keyboard Equivalent: S
Hides the Toolbox and Title Bar, and displays the entire document, if necessary in a reduced format. For example, in 640 x 400 page size in Lo-Res, it shows only every other pixel. If the page is oversized (larger than the screen), you can move the rectangle to view a different area of the screen by holding down the left mouse button; dragging the rectangle to the area you want to view; and releasing the mouse button. You are returned to the current page with the area of the rectangle in view. Pressing any key returns you to the current page without repositioning the view.

For more exact positioning of the rectangle, you can move it with the arrow keys. The arrow keys move the rectangle one unit at a time. (A unit is the page size dimension divided by the screen size. So with 320x200 screen format with 640x400 page, the rectangle moves 2 pixels at a time.) Holding down the Alt key and pressing the arrow keys moves the rectangle in screen size increments.

Screen Format ...

Displays the Screen Format requester. If you select a number of colors that will exceed your available memory, DeluxePaint will retain the format you have selected but use fewer colors. Be sure to save a copy of your current screen before changing screen formats, because once you have reduced the number of colors, the original color information is lost. In addition, note that changing formats eliminates most items from memory, including the Font Directory.

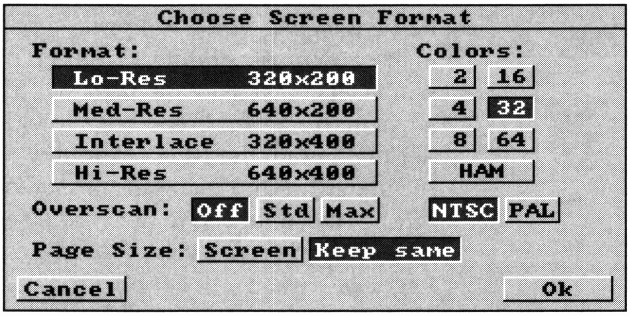


Figure 8.23 Choose Screen Format requester

Lo-Res: This is the default setting, giving you a pixel array of 320 x 200. Lo-Res allows up to 32 colors on the screen.

DeluxePaint IV also supports a special 64 color mode called Extra-Halfbrite. The 64 color Extra-Halfbrite is special in that the first 32 colors in the palette are alterable, whereas the last 32 colors in the palette are half intensities of the first 32 and are not directly alterable by the user.

❖ Not all Amiga 1000 computers support Extra Halfbrite. The easiest way to find out whether or not your computer supports this display mode is to try it. Choose Lo Res and 64 colors in the Choose Screen Format requester and look at the palette (make sure the pointer is not in the Menu Bar or Toolbox). If the last 32 colors are the same as the first 32, your computer does NOT support Extra Halfbrite.

Med-Res: Uses a pixel array of 640 x 200. Pixels in Med-Res format are tall and narrow compared to the other screen formats. This means that if you switch between Lo-Res and Med-Res, objects will become flattened or elongated because of the different pixel shape used by each format. You can compensate for this by using the **Double Horiz** and **Double Vert** options from the Brush menu (see below). Med-Res supports up to 16 colors.

Interlace: Uses interlace techniques to double the number of horizontal lines. The Interlace pixel is wider than it is tall, so moving from Lo-Res or Med-Res to Interlace will flatten images, while moving in the other direction will elongate them. Like Lo-Res, Interlace format allows up to 64 colors on the screen.

❖ Interlace mode produces a flicker on some computer screens. It can be avoided by using a high-persistence monitor.

Hi-Res: Uses a pixel array of 640 x 400. Because Hi-Res also interlaces the horizontal lines, it is subject to the same flicker as the Interlace format. Pixel shape in Hi-Res format is the same as that of Lo-Res. Hi-Res format allows up to 16 colors on the screen. See ***Appendix A*** for more information on memory requirements.

Colors

The maximum number of colors you can use depends on your screen format. A format can use any number less than maximum, so, for example, Interlace, which supports up to 64 colors on the screen, also supports 2, 4, 8, 16, and 32 colors.

HAM

The Hold and Modify display mode (HAM) uses only 16 color registers, but manages to display all 4,096 colors on the screen at the same time. A HAM color is formed by taking the RGB value of the preceding pixel on the screen, and substituting a new value for one of the RGB components.

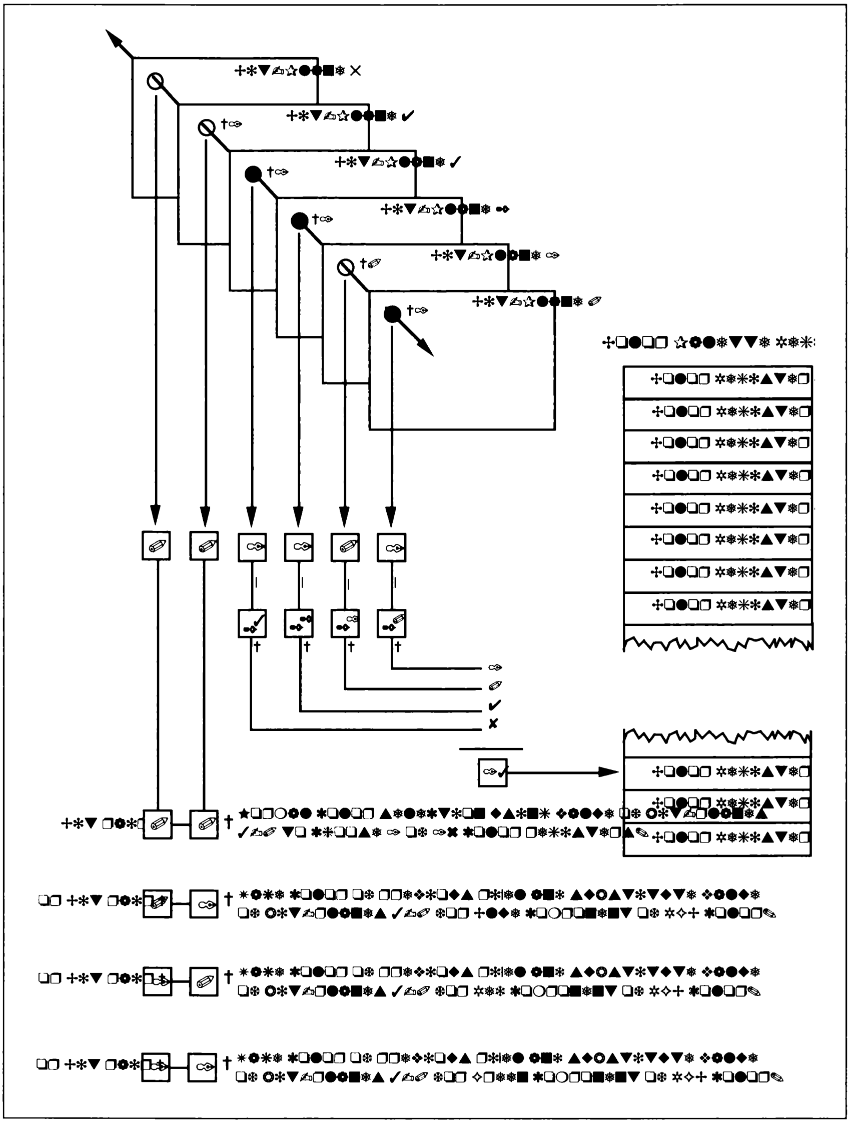


Figure 8.24 Hold and Modify Pixel Color Selection

Because HAM colors are based on color values of the preceding pixel, and only one color value can be changed at a time, it may take three pixels to reach the color you really wanted. In Figure 8.25 it takes three pixels to change black (R0, G0, B0) to white (R15, G15, B15). Note that this example assumes there are no intermediate colors in the normal color registers. This gradual change from one color to the next is sometimes referred to as "ramping" the color, and appears on the screen to the left of HAM pixels. If you need fine details in your picture, you will want to use a color from one of the sixteen color registers, because those colors do not require ramping.

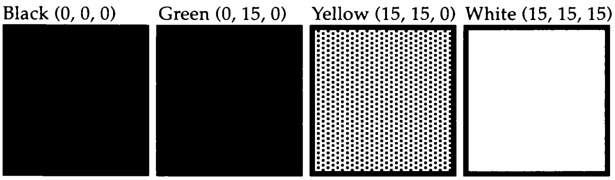


Figure 8.25 HAM Color Ramping

When you paint with a brush over an area made up of HAM pixels, you may see streaks of color running to the right from the edge of the brush. This is a temporary effect called "fringing." When you paint the brush onto the picture, DeluxePaint corrects the fringing, but you may see the "ramping" effect where the program recreates the HAM color to the right of your brush.

◀a▶ In HAM mode there is a selector button displayed under the palette on screen. Click on the arrows to move through the 16 sets (A through P) of 16 colors available in your 256-color set. The "a" group is your palette or base register colors; the other colors in the set are HAM colors.

Overscan

Std puts the screen into standard overscan mode allowing you to view and edit your image in the border area around the normal viewable screen area. Notice that the dimensions of all four screen formats get larger. If the Toolbox or Title Bar are showing when you choose overscan mode, the screen is shifted down and to the left to make sure you can see the controls.

At **Max** setting the viewing area gets even larger. The new vertical and horizontal dimensions of the screen appear beside the screen formats.

If you need to adjust the position of your screen, you can do so by holding down Ctrl and using the cursor keys. This saves you the trouble of exiting the program to adjust your screen through Preferences.

NTSC and PAL Monitors

The **NTSC** broadcast protocol is most common for the United States. The **PAL** protocol is most common in the United Kingdom and Europe. Click your monitor type.

The **Page Size** option lets you choose whether to retain the same page size or change your current screen to the new screen size.

Example #1: **Screen** — If you start in 320 x 200 screen format and move to 640 x 400 format, your image will fill only one quarter of the screen. If you go from 640 x 400 to 320 x 200, you will only retain the upper left quarter of your image.

Example #2: **Keep Same** — If you start in 640 x 400 format and move to 320 x 200 format, you will retain the entire image but you will need to scroll the screen to see all of it.

When you first boot DeluxePaint you are presented with a slightly different version of the Screen Format requester.

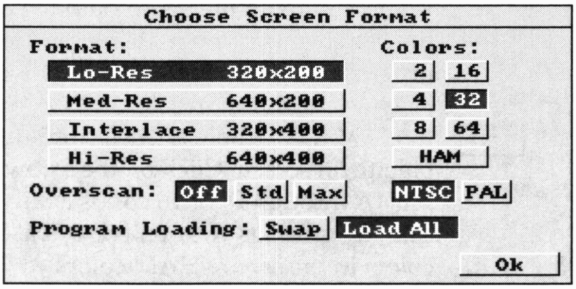
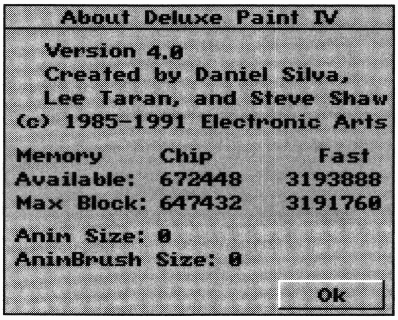

Choose Screen Format
Format:
Lo-Res 320x200
Med-Res 640x200
Interlace 320x400
Hi-Res 640x400
Colors:
2
16
4
32
8
64
HAM
Overscan:
Off
Std
Max
NTSC
PAL
Program Loading:
Swap
Load All
Ok

Figure 8.26 Choose Screen Format requester at program start up

The basic difference is that you need to specify how the program is loaded. Clicking on the **Load All** button loads the entire DeluxePaint program into memory, while clicking on the **Swap** button causes parts of the DeluxePaint program to load into memory as they are needed leaving more memory available for image data. Owners of 1MB Amigas are advised to start up the program in Swap mode, particularly if they intend to create animations.

About ...

The program's About requester shows the program version number, the authors' names, the copyright notice, and information about the amount of available memory and the size of your animation or AnimBrush.



About Deluxe Paint IV

Version 4.0
Created by Daniel Silva,
Lee Taran, and Steve Shaw
(c) 1985-1991 Electronic Arts

Memory	Chip	Fast
Available:	672448	3193888
Max Block:	647432	3191760

Anim Size: 0
AnimBrush Size: 0

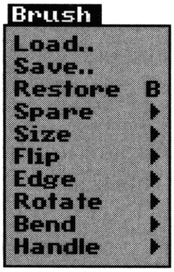
Figure 8.27
The About box

Quit

Keyboard Equivalent: Q
Exits DeluxePaint.

Brush Menu

Load ...



Displays the Load Brush requester. This is identical in function to the Load Picture requester, except that you are loading brushes rather than pictures. When you load a brush that has a palette different from that of the current picture, the picture palette remains in place. Nonetheless, the brush palette information is loaded along with the brush; you can change to the brush's palette at any time by choosing **Palette>Use Brush Palette** from the Color menu. If you wish to revert to the previous palette, use **Palette>Restore Palette** option.

Save ...

Displays the Save Brush requester. This requester is identical in function to the Save Picture requester (see **Save** in the Picture menu,above). Brushes are saved with their palettes, which includes color cycling information.

Restore

Keyboard Equivalent: B
Restores as the current brush the custom brush you last used, *after you've used an AnimBrush, a built-in brush, or modified your custom brush with an option from the Brush menu.* Restore does not reverse the effect of all brush manipulations in the Brush menu. Generally the options that cannot be reversed with Restore can be reversed by choosing the option again. For example, Restore does not reverse the **Flip>Horiz** option, but choosing **Flip>Horiz** again (with no intervening commands) returns your brush to its previous state.

❖ It's a good idea to save your custom brush, or stamp it down on the spare page if you want to do a lot of experimenting. This way you'll have your original brush to go back to.

Spare ▶

The Spare option's submenu has options for manipulating DeluxePaint's spare brush.

Brush->Spare

Keyboard Equivalent: Alt-n
Moves the current brush to the spare brush position (which is hidden). If your current brush is an AnimBrush, the current cel of the brush is copied to the spare brush position.

Brush<->Spare

Keyboard Equivalent: Alt-b
Swaps the current brush and the spare brush positions.

Metamorph . . .

Keyboard Equivalent: Alt-m
Lets you create a special AnimBrush that metamorphoses between the shape and colors of the current brush and the shape and colors of the spare brush. To use this option, you must first have a custom brush and a "spare" custom brush.

When you choose Metamorph, the Make AnimBrush requester appears. Enter the number of cels you want in the AnimBrush. Enter a number and click Ok. DeluxePaint creates the AnimBrush automatically.

For best results, your custom brush and spare brush should be picked up with the same dimensions. This does not mean that the brush images must be the same size; but the area that you surrounded to pick up the brush images should be the same size.

The resulting first and last cels of the AnimBrush generally do not contain exactly the same images as your original custom brush and spare brush. Usually you will see some change in the colors of the first or last frames.

❖ You should not attempt to metamorph brushes that are wider than around 250 pixels. Morphs of this large size may yield unpredictable results. Under no circumstances should you attempt to morph a custom brush that is larger than the screen.

See the metamorphosis exercise in Chapter 6, ***Animation Basics***, for more information.

Size ▶

The Size option lets you resize the current brush. The submenu presents the following options.

Stretch

Keyboard Equivalent: Z
Lets you freely stretch the current custom brush in any direction to any size. To stretch the brush, drag it to the desired size. Select **Restore** from the Brush menu to negate the effect of the stretch.

⇧ Holding down the *Shift* key constrains the stretch operation so that your brush maintains the same aspect ratio (relative width and height)

❖ Stretching a brush uses a lot of memory; if you try to stretch a brush to a size bigger than the available memory can accommodate, the brush will snap back to its original size.

Halve

Keyboard Equivalent: h
Reduces the size of your brush by 50% in vertical and horizontal dimensions. For instance, a 20 X 20 brush is resized to 10 X 10.

Double

Keyboard Equivalent: H
Doubles the size of your brush in both dimensions, for a quadrupling of the total area. For instance, a 20 X 20 brush is resized to 40 X 40.

Double Horiz

Keyboard Equivalent: X
Doubles the size of your brush in the horizontal dimension. This option is useful for reproportioning images that you created in Lo-Res and then moved to Med-Res (see **Screen Format** under the Picture menu).

Double Vert

Keyboard Equivalent: Y
Doubles the size of your brush in the vertical dimension. This option is useful for reproportioning images that you created in Med-Res and then moved to Lo-Res (see **Screen Format** under the Picture menu).

❖ Doubling the size of a brush may require more memory than you have available. In that case, the resized brush may appear only as an outline.

Flip ▶

Lets you flip a brush about its X or Y axis. When you Flip an AnimBrush, all frames of the animated brush will flip.

Horiz

Keyboard Equivalent: x
Flips the current custom brush about the horizontal or X axis.

Vert

Keyboard Equivalent: y
Flips the current custom brush about the vertical or Y axis.

Edge ▶

Modifies a one pixel boundary around the current brush.

Outline

Keyboard Equivalent: o
Adds a one pixel boundary around the current custom brush using the current foreground color. This is ideal for outlining text. To increase the thickness of the outline, one pixel at a time, select Outline repeatedly.

❖ Outlining in HAM mode with a HAM color may supply different results. The boundary color you get may be different from the foreground color if one pixel is not sufficient to "ramp" to the HAM color.

Trim

Keyboard Equivalent: O
Deletes a one pixel boundary around the current brush. You can trim repeatedly.

Rotate ▶

Rotate the current custom brush in any of three ways.

90 Degrees

Keyboard Equivalent: z
Rotates the current brush clockwise 90 degrees.

Any Angle

Lets you rotate the current brush any number of degrees.

▶ Choose Rotate>Any Angle from the Brush menu. Hold the left button down and drag the rectangular outline about its bottom left corner. Release the button at the desired orientation.

If you select this option more than once, your brush reverts to its original orientation before you rotate it again.

Shear

Gives you controlled distortion of the current brush. The top part of the brush is anchored, and you can drag the bottom of the brush in either direction.

Bend ▶

Use this option to bend a brush horizontally or vertically.

Horiz

Lets you bend the current brush in a horizontal direction.

▶ Choose Bend>Horiz from the Brush menu. Drag the brush outline left or right until it is the desired shape. Release the mouse button.

The vertical position of the cursor to the brush determines where the brush bends.

Vert

Lets you bend the current brush in a vertical direction.

▶ Choose Bend>Vertical from the Brush menu. Drag the brush outline up or down until it is the desired shape. Release the mouse button.

The horizontal position of the cursor to the brush determines where the brush bends.

Handle ▶

Lets you specify whether the cursor holds a custom brush by its center (the default), by one of its four corners, or by an offset position, which you can define. Use the keyboard equivalents to adjust your brush handle when you need to move your cursor without moving the brush. You can move the brush handle with the mouse button *down* this way.

Center

Keyboard Equivalent: Alt-s
Positions the arrow cursor, which represents the handle, at the center of the brush. This is the default position.

Corner

Keyboard Equivalent: Alt-x and Alt-y
Positions the arrow cursor, which represents the handle, at one of the four corners of the brush. If you have a custom brush currently held at the center, selecting Corner moves the arrow cursor to the lower right corner of the brush. Use Alt-x to toggle between the lower corners. Use Alt-y to move the handle to the top of the brush and toggle between the upper corners.

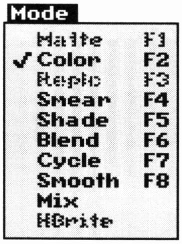
The location of the arrow cursor the next time you pick up a brush depends on the direction you drag the mouse when you pick up the brush. If you drag down and to the right, the cursor will remain at the lower right. If you drag up and to the left, the cursor will move to the top left. The same principle applies if you drag down and to the left or up and to the right. In other words, the corner you drag to is the one to which the arrow cursor will attach.

Corner is particularly useful in Perspective mode (see the Effect menu, below).

Place

Keyboard Equivalent: Alt-z
Lets you position the brush handle at any position relative to the brush. To place the handle, pick up your brush. Choose **Handle> Place**. Drag in any direction to offset the cursor from the brush. When you release the mouse button, the cursor will hold the brush as you specified.

Mode Menu



The Mode menu contains different brush modes. These modes determine which color(s) in your brush are used when you paint. Most of the modes have keyboard equivalents, using the funtion keys (F-keys) on the top row of your keyboard.

❖ With the exception of Shade, none of the modes affect the color used when you paint with the right mouse button. Except in Shade mode, the right mouse button paints using the current background color in Color mode.

Matte

Keyboard Equivalent: `F1`
Uses a custom brush in its original form. Those areas of the brush, which match the background color that was in effect when the brush was first created, are transparent. Matte is the default mode when you create a custom brush using the Brush Selector.

Color

Keyboard Equivalent: `F2`
Uses the shape of the brush and fills it with the current foreground color. Those areas of the brush, which match the background color that was in effect when the brush was first created, are transparent.

Replc

Keyboard Equivalent: `F3`
Uses the custom brush in its original form (i.e., **Matte**, see above), except that no colors are transparent.

Smear

Keyboard Equivalent: `F4`
Smears any colors on the page when you drag a brush over them. This is like smearing a wet watercolor with your fingers, so the bigger the brush, the more pronounced the effect. Smear uses only the colors under the brush, and does not add any new colors. Current brush color is irrelevant.

Shade

Keyboard Equivalent: `F5`
Shade helps you create subtle shading effects on those colors in your picture that are in a cycle range. Like **Smear**, Shade ignores the current brush color but uses its shape. By dragging the brush over those colors in your picture that are in the currently selected cycle range, you can paint over each color with the next color in the range. You can paint with the next-higher color by using the left mouse button, and the next-lower color by using the right mouse button.

"Higher" and "lower" are relative to the color under the brush at the time. Shade has no effect on colors outside the current range. You select a range from the Range requester, the Fill Type requester, or by using the keyboard equivalent (Alt-[and Alt-]) to step through the ranges.

Blend

Keyboard Equivalent: `F6`
Like **Smear**, Blend affects the colors under the brush by running them together. Unlike **Smear**, however, Blend uses additional shades by averaging the blended colors, whereas **Smear** uses only the colors under the brush. Thus, when you Blend two shades by painting over them, you are selecting a third shade from the palette, the closest one the program can find to the average of the two original shades.

Cycle

Keyboard Equivalent: `F7`
Uses the current brush shape and cycles through all the colors in the currently selected range as you draw. A range is selected if one of its members is selected. If a color is a member of two ranges, selecting it selects the first of those two ranges. If your current brush color is not within a cycle range, it paints with that color only. Use **MultiCycle** (in the Prefs menu) to achieve the same effect with a multicolored brush, where each color in the brush cycles through its range independently of the others.

Smooth

Keyboard Equivalent: `F8`
Softens hard lines and reduces the contrast between adjoining areas. DeluxePaint finds colors in the palette between the two bordering colors and paints the boundary in intermediate shades. Smooth looks at the current palette and finds the colors closest to the ones under the brush. Thus if the palette contains a wide selection of colors close to the ones under the brush (e.g., the selection of grays in the default palette), it will have more colors to draw from to create its weighted averages. Smooth is useful for creating airbrush effects and for eliminating jagged edges.

Mix

The color of your brush mixes interactively with the colors already on the screen (in your image). This is particularly effective in HAM.

HBRITE

This mode is only available if your computer supports it, and if you have selected 64 Colors from the Screen Format option in the

Picture menu.. When you are in HBrite mode, painting with the left mouse button darkens colors on your painting to their halfbrite equivalent; painting with the right button lightens colors that are halfbrite. This mode is especially useful in pictures with shadow and highlight effects.

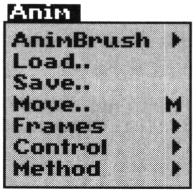
The Amiga supports only 32 color registers directly, but Halfbrite uses a trick to double the number of colors available on the screen. The first 32 registers are standard color registers; the second 32 are halfbrite equivalents of the original 32. Pixels that use halfbrite colors point to one of the standard color registers and indicate that the color should be displayed at half its normal intensity. This means that the second 32 pixels are not independent of the first 32; you can change the color values only in the first 32 registers, and the change is automatically reflected in the halfbrite equivalent.

❖ Not all Amiga computers support Halfbrite. If HBrite is grayed out in the Mode menu, you can't select it.

Anim Menu

AnimBrush ▶

AnimBrush is a special type of brush that has more than one cel associated with it.



Load ...

Displays the Load AnimBrush requester. This requester is identical in function to the Load Picture requester described under **Load** in the Picture menu, except that you are loading an AnimBrush.

When you load an AnimBrush that has a palette different from that of the current picture, the picture's palette remains in place. Nonetheless, the brush palette information is loaded along with the brush; you can change to the brush's palette at any time by choosing **Palette>Use Brush Palette** from the Color menu.

Save ...

Displays the Save AnimBrush requester. This requester is identical in function to the Save Brush requester described in the **Save** option of the Brush menu.

Pick up ...

Selecting Pick up is similar to selecting the Brush Selector (rectangular mode) from the Toolbox. However, when you pick up an AnimBrush, you pick up all the "cels" that make up the animated sequence in the AnimBrush.

❖ Cels are to an animated brush what frames are to an animation.

When you paint with an AnimBrush, the brush cycles through its frames automatically as you paint. The brush will continuously cycle on the current animation frame unless you hold down the *Alt* key when you press the mouse button down, in which case the brush will paint each of its cels separately into each of the animation sequence frames.

Choosing Pick up displays the Pick up AnimBrush requester. To pick up the whole animation, click Ok; drag the cross hair to select the entire "animated" area. When you release the mouse button, DeluxePaint attaches an animated brush to your cursor. You can use an AnimBrush with any painting tool, just as you would use a custom brush.

❖ If you want to make an AnimBrush from only a few frames of your animation, you only need to pick up those frames. Move to the first frame in your intended AnimBrush, and choose **AnimBrush>Pick up**. Type in the number of cels that will compose your AnimBrush in the Pick up AnimBrush requester. Click Ok.

For example, let's say you have an animation of 15 frames. And that you want to make an animated brush out of what appears on frames 6 through 10. You would move to frame 6, type 5 in the Pick up AnimBrush requester, and click Ok. Frames 6 through 10 make up cels 1 through 5 of your new AnimBrush.

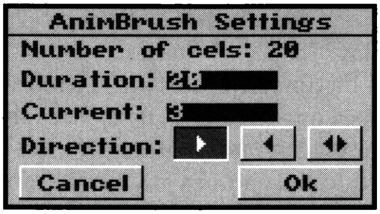
Note, however, that you cannot pick up an AnimBrush of only one frame.

Alt

Holding down the *Alt* key while picking up a brush with the Brush Selector is the same as choosing AnimBrush>Pick up. The Pick up AnimBrush requester appears. Type in the number of cels that will compose your AnimBrush and click Ok.

Settings ...

After you have picked up an animated brush, Settings displays the AnimBrush Settings requester. Use this requester to control the AnimBrush.



AnimBrush Settings

Number of cels: 20

Duration: 20

Current: 8

Figure 8.28
Settings requester

Number of cels

Shows you how many cels of animation are in your AnimBrush.

Duration

Lets you set the number of frames it takes the AnimBrush to move completely through its cels. You can also think of this as the rate at which the AnimBrush transforms. For example, if your brush has 10 cels and you set duration to 20, your brush will stamp each of its cels twice before flipping to the next cel.

Current

Lets you type in the value for the brush cel you want to start with. This is very useful if you want to continue painting from a particular cel of your brush.

When the requester is not displayed, you can step backward and forward though the cels of your AnimBrush by pressing 7 or 8 on the keyboard (not the keypad). Shift-7 steps to the first cel, and Shift-8 steps you to the last cel.

Direction

These three icons give you the choice of flipping forward, flipping backward, or ping-ponging through the cels of your AnimBrush as you paint.

Use

Makes the last AnimBrush you "picked up" the current brush. This lets you pickup an AnimBrush, then pickup a regular brush, and then return to your AnimBrush. You can also restore your AnimBrush by right-clicking the Brush Selector. This toggles between a standard custom brush and an AnimBrush.

Free

Releases the memory used by the current AnimBrush.

❖ You cannot retrieve the brush once you free it! Any time you think you are low on memory, but *before* you throw away brushes or frames, press Ctrl-a. This displays information about available memory in the menu bar.

Load ...

Displays the Load Anim requester. This requester works like the Load Picture requester (see **Load** under the Picture menu). When you *load* an animation, it replaces the one currently in memory. When you *append* an animation, the appended animation is added to the end of your current animation.

It is also possible to load individual pictures into the frames of your animation using the Load Picture requester. To do so, go to the frame you wish to load a picture into, display the Load Picture requester and select the picture you wish to load. Your animation will take on the palette of the picture loaded. If you want to restore your animation's palette, choose Palette>Restore Palette from the Color menu. If you want to remap the picture just loaded to the Animations original palette, choose Remap from the colors menu and select current frame from the requester that appears. See **Load** in the Picture menu for more information.

Save ...

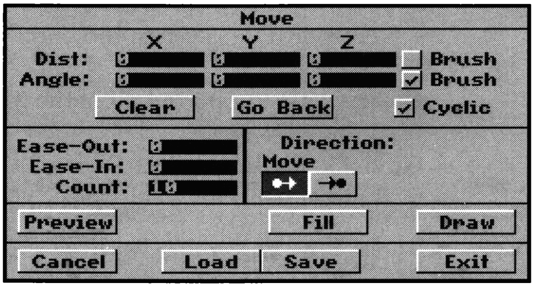
Displays the Save Anim requester, which works like the Save Picture requester described under **Save** in the Picture menu. The one difference is that the Frames edit boxes in the Save Anim requester let you save a section of your animation as an *animation* rather than as a series of pictures as in the Save Picture requester.

Move...

Keyboard Equivalent: M
Displays the Move requester. Use this requester to define a path along which your brush is painted in 3D, either on a single frame, or while stepping through an animation sequence.

To use the Move Requester:

- Stamp your brush on the screen at the starting position you want.
- Choose Move from the Anim menu.
- Enter the Distance and Angle settings you want.
- Set the Count edit field to the number of frames over which you want to animate the brush.
- Select the Direction of your Move and Record.
- Select any other settings that apply to your animation.
- Click Draw to paint the animation with the settings you specified.



Move

	X	Y	Z	
Dist:	0	0	0	☐ Brush
Angle:	0	0	0	☑ Brush

☑ Cyclic

Ease-Out: 0
Ease-In: 0
Count: 10

Direction:
Move

Figure 8.29 The Move requester

Dist: The Dist edit boxes let you specify the total distance in pixels that the brush will move along the X, Y, and Z axes in your animation.

You can set the brush to move along the brush axes (√) or the screen axes (no √) by clicking the Brush action button to the right of the Dist edit boxes.

Angle: The Angle edit boxes let you specify the total angle, in degrees, that the brush will be rotated about the X, Y, and Z axes.

You can set the brush to rotate around the brush axes (√) or the screen axes (no √) by clicking the Brush action button to the right of the Angle edit boxes. Brush axes are active by default, which means the rotation is always based on the brush coordinate system.

❖ The brush coordinate system will change during the course of a Move if you are rotating on more than one axis.

If the Brush action button is *unchecked*, any angle rotation takes place along the current axes of the screen coordinate system. The "screen" rotation system is an Euler (pronounced *oiler*) system, and the order of rotation is always X, Y, and Z. When you rotate on more than one angle, or when the brush has been rotated previously, the rotations produced by the screen angle system are not always around the axes that are used for the Distance moves along the screen axes. Generally it's better to think of the screen angle rotations as "non-brush" rather than screen.

❖ All rotations occur around the brush handle. If you want your brush to appear as though it is orbiting around a point away from the brush, you would want to offset the handle from the brush.

Brush: Click these action buttons to toggle a √ on and off. The option selects whether the Dist and Angle movements are relative to the brush's coordinate system (√=on) or relative to the screen coordinate system (no √=off).

Clear: Click to zero out all of the Move and Angle numbers.

Go Back: Click to restore the brush's starting position (for the next movement) to the last place you manually clicked it down.

Cyclic: Click this button to turn it on (√), if you are creating an animation that is cyclic (that is, one that starts and ends at the same position).

For example, if you have 10 frames, and you want a brush to rotate 360 degrees over the 10 frames to make it look as though it is spinning when you play the animation, you would turn Cyclic on. DeluxePaint IV would calculate the rotation to end on the 11th frame (which in this case would be the 1st frame). The result is that the brush is not rotated to a full 360 degrees on Frame 10. Instead, the brush reaches 360 degrees on Frame 1. DeluxePaint doesn't paint the brush on the last frame, since it's position would normally be the same as your original frame, but it does move forward to that frame and positions the brush in the event that you want to click it down.

Ease-Out: Set the number of frames over which you want the brush motion to gradually accelerate.

Ease-In: Set the number of frames over which you want the brush motion to gradually decelerate.

Count: Set the number of times the brush is painted to complete the total movement and rotation as specified by the dist and angle edit boxes.

Direction: The Direction action buttons control the direction of your move and the order in which the frames of the animation are painted.

Move lets you choose to have a move drawn in one of two ways.

●→ **Go From** starts the movement of the brush from the point where you stamped your brush (indicated by the large dot) and paints forward.

→● **Come To** starts the animation at an earlier frame and moves the brush forward to the point where you stamped your brush.

Record lets you choose the order in which the frames of the brush move are painted. These buttons are available only if you have more than one animation frame.

» **Forward** paints the move by stepping forward from the point where you stamped your brush. This is the default setting and the one you will use most often.

II **In Place** paints all of the move on the current frame.

« **Backward** paints the move in reverse order by advancing to the last frame and painting backwards. This option is useful when you are using Trails.

Preview: Click to view (in "wire-frame" mode) the move you have set up. When the preview is complete, the Move requester returns. To interrupt the preview, and return to the Move requester, hit the *space bar.*

Trails: This button is available only if you have more than one animation frame allocated. Clicking Trails is like clicking on the Draw button except on each frame you get the sum total of all of the draws up to this point. The net effect is that of leaving "trails" of the brush as it moves.

Fill: Works like draw, except that when you click it, the move you specified is used to draw a filled perspective plane based on the rotation of the current brush.

Draw: Executes the move that you have specified, causing the brush to be drawn into animation sequence.

Cancel: Restores any settings that have been changed and exits this requester.

Exit: Exits the requester and keeps all of the settings that you have entered.

Frames ▶

Presents a submenu of options for manipulating the frames in your animation.

Set # ...

Displays the Set Frame Count requester. DeluxePaint will try to allocate as many frames as are requested. If there is not enough memory to allocate the requested number of frames, DeluxePaint will allocate as many as memory will allow.

You can use this requester to add or delete frames to your animation. For example, you could add several frames to the middle of your animation by stepping to the frame you want to add frames *after* , and changing the number of frames to the current count plus the number of frames you want to add.

Similarly, you could delete several frames from any point in your animation by stepping to the first frame you want to delete and changing the number of frames to the current count minus the number of frames you want to delete. For example, if you have 100 frames and you want to delete frames 41 to 50, step to frame 41 and set the number of frames to 90.

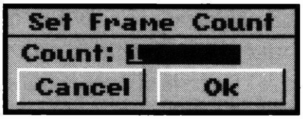


Figure 8.30
Set Frame Count requester

Add Frames . .

Displays a requester that lets you add any number of frames after the current frame. DeluxePaint copies the contents of the current frame to the added frames, and makes the last new frame the current one.

Keyboard Equivalent: Click on the + icon in the Animation Control Panel. Alt-= will automatically add a single frame to the animation.

Copy Frames . .

Displays a requester that lets you copy the current frame to a range of frames or to all the frames in your animation sequence. Use the Insert Before Frame edit box to place the copied range of frames in your animation.

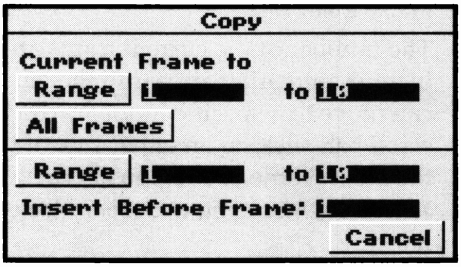


Figure 8.31 Copy frames requester

Delete Frames . .

Displays a requester that lets you delete the current frame, a range of frames or all frames in your animation sequence. If you delete the current frame, DeluxePaint makes the following frame the current frame unless you are already at the last frame.

Keyboard Equivalent: Click on the - icon in the Animation Control Panel.

Control

Control displays a submenu of options for moving around in your animation frames and for playing the animation.

Panel On/Off

Keyboard Equivalent: Alt-a
Displays the DeluxePaint Animation Control Panel. It contains a Frame Counter scroll bar and 15 control buttons for working through and playing your animations. Click an option on the Panel to select it.

- ❖ The options represented by the control buttons can also be selected from the Anim and Effect menus, which is where these features are described in detail. It is convenient to have them all in the Control Panel, so you don't have to access a menu, or use the keyboard while you're working on your animation.

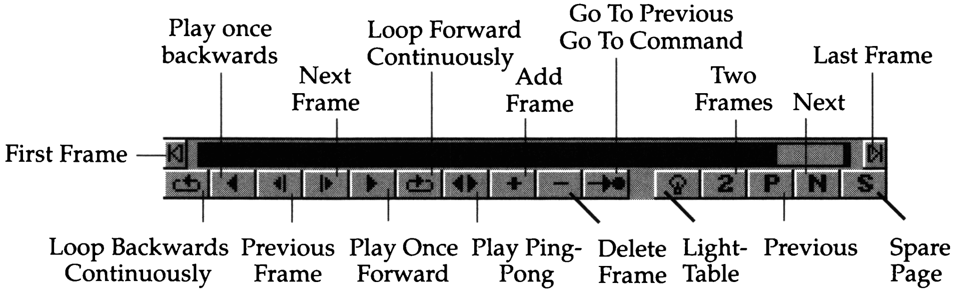

Play once backwards
Loop Forward Continuously
Go To Previous Go To Command
Last Frame
Next Frame
Add Frame
Two Frames
Next
First Frame
Loop Backwards Continuously
Previous Frame
Play Once Forward
Play Ping-Pong
Delete Frame
Light-Table
Previous
Spare Page

Figure 8. 32 Animation Control Panel

Frame Counter

The number of the current frame and the total number of frames in your animation appear in the left corner of the Title Bar. You can move to a specific frame by dragging the Frame Counter scroll bar, clicking on either side of the scroll box, or by clicking the Next Frame or Previous Frame icons in the Control Panel. Any movement you make is reflected in the numbers on the Title Bar.

Set Rate ...

Displays the Set frames per second requester. The default setting is 30 frames per second (fps). The speed range is between 1 and 60 fps, though results of settings over 30 fps are unpredictable. You can set the frames-per-second rate by entering a number in the edit field and clicking Ok.

Set Range ...

Displays the Set Play Range requester. Use this requester to instruct DeluxePaint to play any range of frames, or all frames in your animation.

- ❖ The *From* number in your range must be smaller than the *to* number for the range to play correctly.

The range setting is used by the Play Once and Ping Pong options in the Control submenu, but the Play option is not affected.

This option is especially useful if you are editing a small section of a large animation. You can edit the frames and play only the frames you are editing to see your changes.

Previous

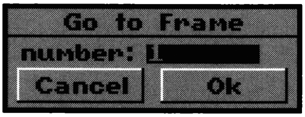
Keyboard Equivalent: 1
Steps the current frame to the previous frame in the animation sequence. If the current frame is the first frame, the position is set to the last frame.

Next

Keyboard Equivalent: 2
Steps the current frame to the next frame in the animation sequence. If the current frame is the last frame, the position is set to the first frame.

Go to ...

Keyboard Equivalent: 3
Displays the Go to Frame requester. This requester lets you position the current frame to any of the available animation frames. You can also display this requester by Ctrl-clicking the Go to icon on the Animation Control Panel.



number: 1

Figure 8.33
The Go to Frame requester

Repeat last Go to *Keyboard Equivalent: Shift-3*

Clicking on this icon brings you to the frame number set in the Go To requester. You can display this requester either by choosing Control>Go to from the Anim menu, or by Ctrl-clicking on this icon.

Play

Keyboard Equivalent: 4
Plays the animation at the speed set in the Set Rate requester. The animation sequence will continue cycling until you press the *space bar.* (You can reverse the direction of playback by pressing **r** on the keyboard while the animation is playing.)

Play once

Keyboard Equivalent: 5
Plays the animation sequence once through from Frame 1 to the last frame.

Ping-pong

Keyboard Equivalent: 6
Plays the animation sequence continuously as in **Play** above, but plays the sequence forward then backward then forward then backward and so on. Click or press the *space bar* to stop the animation.

Method ▶

The Method menu contains two submenu options which can be used to specify the "memory model" of the animation sequence frames. The memory model refers only to the animation in RAM, not to the disk file. When you load an animation, it is loaded into your current memory model.

Compressed

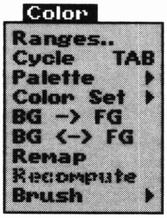
The Compressed Method, while a little more complex than the Expanded Method, offers the advantage of permitting many more animation frames in memory at one time. The compressed memory model only needs enough memory to store the differences between frames. While this model allows for more frames, it has a couple of disadvantages: it is slower than the expanded method while animpainting, loading and saving are slower, and memory tends to fragment, making it easy to run out of memory.

Expanded

The Expanded Method represents the simplest of the two memory models where all of the memory for each animation frame is allocated. If you are in low resolution mode, 320 x 200, and you have 10 animation frames, then you would need enough memory to hold 10 complete 320 x 200 images. Two advantages of this method are that the frame flipping for animpainting is very smooth, and you will not run out of memory to add an element to your animation within the allocated frames.

If you set this option and then request animation frames, DeluxePaint automatically inserts the maximum number of available frames in the Set Fame Count requester so that you don't have to guess how many frames you can create.

Color Menu


Color
Ranges..
Cycle TAB
Palette
Color Set
BG -> FG
BG <-> FG
Remap
Recompute
Brush

Ranges ...

Keyboard Equivalent: Ctrl-r
Displays the Range requester, which you can use to define customized color ranges for the color cycling, gradient fill, and Shade features of DeluxePaint.

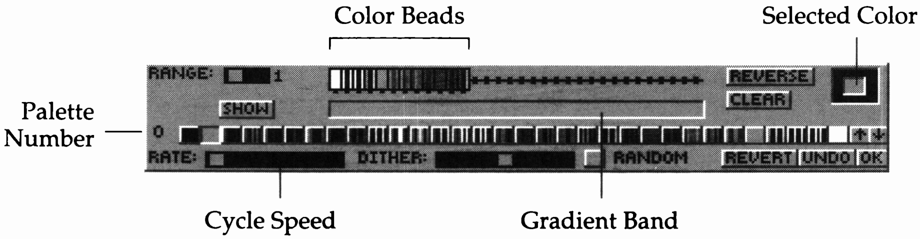

Color Beads
Selected Color
Palette Number
Cycle Speed
Gradient Band
RANGE: 1
SHOW
REVERSE
CLEAR
0
RATE:
DITHER:
RANDOM
REVERT
UNDO
OK

Figure 8.34 Range Requester

The requester lets you specify the colors in a range (maximum of 32 colors), and how the colors are mixed. You can define eight ranges for each picture.

To define a range:

- The RANGE slider indicates the number of the current range. By default this is range 1. You can see the range of colors displayed on the range bar. Click to the right of the slider or drag the slider to the right to access an empty range bar.

  All range-based features depend on the Range number set in this requester. Once you've created ranges to work with, you can step forward and backward through them without entering the requester by pressing Alt-] and Alt-[.

- To select a color for the range, move the arrow cursor to the row of colors in the requester and click one.

When you click a color, it appears in the sample square. The arrow cursor becomes the color bead cursor. If you *don't* want to use the color you chose, click another with the color bead cursor. When the color you want is in the sample square:

- Move the bead cursor to the range bar. Position the cursor where you want the selected color to fall in the range, and click. The color appears in the range.

  The position of colors in the range control the cycle direction for each range, and also sets the direction of the range when it is used as a gradient. The start color is the color furthest left on the range bar. Any color cycling begins with this color.

REVERSE Keyboard Equivalent: Alt-r

You can reverse the direction of the color range, and therefore the direction of cycling and gradient by clicking the REVERSE action button.

- Select another color and position it on the bar. Repeat this step until all the colors you want are on the bar. To reposition a color on the bar, click it, move the bead cursor to another position, and click again.

CLEAR To eliminate a color from the bar, click it, move the bead cursor off the bar, and click again. The arrow cursor returns.

To eliminate all colors from the range, click the CLEAR action button.

Each color you place on the bar appears in the range sample. The gradient between colors, that is the transition of shades from one color to the next, is calculated automatically. You can place original colors far apart to create subtle blending of colors, or close together to create more abrupt transitions between original shades.

In modes other than HAM, DeluxePaint can use only colors currently in the palette to make these transitions. If the transitional shades are not in the palette, colors may appear as discrete or unevenly mixed bands in the range. You can overcome this limitation by adding the transitional shades to the palette.

COPYING TIP

- ❖ It is possible to copy a range to the next range set in the requester. To do this: Move to a defined range you want to copy; drag the Range slider to the range number you want to copy to; click Undo. (It's important to click Undo with no intervening clicks after you display the range number you want to copy to.)

SHOW

Click SHOW to see the results of your color selections and placements. The band beneath the bar shows the gradual transition from color to color as it would appear if you had access to all 4096 colors in the color universe (as you do in HAM mode). When you're not in Ham mode, a band above the Range requester shows the gradient as it will appear using the available colors in the palette of your current mode.

Rate

The Rate slider lets you control the speed of color cycling for each range. Drag the slider to the right for faster cycling. While dragging the slider you can monitor the color cycling on the page, even if Color Cycling is turned off. The number to the right of the slider indicates the current speed setting. This number is intended to help you set different ranges to the same speed. The number does not indicate the relative speed of the cycling since the increments from 0 to 63 are not equal.

Random

When you click the Random action button, a √ appears. When Random is on, the border between any two colors in the gradient is randomly mixed (rather than mixed by pattern), depending on how you have set the Dither slider. Click the action button to turn off Random.

Dither

Dither is only active when Random is selected. Dithering reduces the contrast between adjacent colors (without changing the colors themselves). Drag the Dither slider to the right to increase the amount of dither. Setting the slider all the way to the left gives almost no random mixing between shades. Moving the slider to the right increases the amount of mixing at the color boundaries.

- ❖ If you are not in HAM mode, and you have placed colors on the gradient bar with empty notches between the colors, you may not see the dither effect you expect. When you leave notches between colors on the bar, DeluxePaint calculates the spread of colors that would fill the notches and then looks in

> the palette for the closest matching colors to fill in the range. In many cases, the closest color will be one of the colors already on the bar. A dither between two identical colors will look like no dither at all.
>
> In modes other than HAM, it is advisable to always place all the colors you want in your gradient on the bar with no empty notches between them. This way you will get exactly the colors you expect, and the dither will appear as you would expect it to.

If you are working in HAM mode, you won't see the dither effect in the gradient sample painted in this requester. To see the gradient with dither effects, go to the Fill Type requester.

REVERT This returns the Range requester to the condition it was in before you displayed the requester.

UNDO You can reverse the last change you made in the palette by clicking UNDO.

You can reverse the last change you made in the Range requester by clicking UNDO.

Cycle

Keyboard Equivalent: Tab
Toggles color cycling on/off. Color cycling uses the color ranges you define in the Range requester. (See **Range**, above.) If a color is not included in any range, it does not cycle. See *Animation with Color Cycling* in Tutorial One of Chapter 4, ***Painting Tutorials***.

Palette ▶

Mixer On/Off

Keyboard Equivalent: p
Displays/removes the Color Mixer. You can also display this Mixer by right-clicking the Color Indicator (between the Palette and the Toolbox).

❖ There is a subtle but important difference between removing the Color Mixer by choosing the menu option and by clicking OK. When you choose the menu option or press "p", the Color Mixer is hidden behind the current screen and the data in the Mixing Area remains intact when you redisplay the requester. Clicking OK in the accepts all changes in the Color Mixer and clears the Mixing Area.

The Color Mixer is the master color control panel. From here you can mix and modify colors, create spreads, and copy or exchange colors.

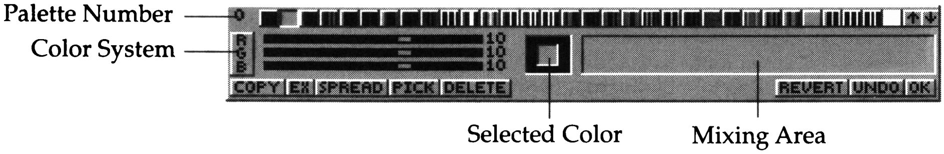


Figure 8.35 The Color Mixer requester

The Color Mixer and the Arrange Palette requester described below let you work with a 256 color Color Set, regardless of the number of colors you are actually using in your current screen format. If you are in a mode other than HAM, you can paint only with the colors that are in the Palette. The Palette colors are arranged in the first slots of row 0. You can identify them by the white highlight on the top and left edge of each color. The other Color Set colors have a light blue highlight on the top and left edge. Occasionally you will see us refer to your Palette colors as your "base register" colors.

❖ In Extra Halfbrite mode (64 color mode) you cannot modify the colors in row 1. These are the halfbrite colors, and always take the halfbright value of the corresponding Palette colors in row 0. If you attempt to copy to, exhange with, delete, or spread the halfbrite colors, nothing will happen.

In HAM mode, you can paint with any color in the 4096 color universe. The Color Set is merely a holding spot for extra colors beyond your "base register" colors.

COMPATIBILITY NOTE

❖ We have found that several other painting and viewing programs incorrectly assume that the palette will contain no more than the maximum number of colors in the pictures display mode. These programs will not correctly load a picture saved with a Color Set. At this time, for maximum compatibility, any pictures you are distributing should be saved with no colors in the Color Set beyond the Palette colors. You can delete the colors in your Color Set with the Delete button in just a few steps. We hope that in the near future these other programs will correctly ignore the extra colors in the Color Set if they are not able to use them.

Modifying Colors

DeluxePaint IV lets you modify colors with either the RGB or the HSV color mixing systems. Click the RGB (or HSV) action button to expose the other. Let's say you want to modify an individual color to use in the foreground. Here's how to do it.

▶ Click the color you want to modify either in the requester's row of colors or wherever the color appears on the page. The selected color is displayed in the sample-color box.

❖ You can use the up and down arrows at the right end of the palette to expose the next row of 32 colors. You can also Shift-click on the arrows to scroll directly to the first or last row of colors.

▶ Move the box(es) inside the slider(s) to modify the selected color, by varying the proportions of Red, Green, and Blue (RGB). To move a box, click on either side of it (inside the slider) or drag the box left or right.

RGB color mixing is the default setting. The HSV method is simply an alternative method; it yields identical results. HSV breaks each color down into its Hue, Saturation, and Value.

☐ Hue refers to the color's position on the color spectrum. As you move the box along the Hue slider (starting from the left), your current color changes to a shade of the following colors—Red, Orange, Yellow, Green, Blue, Purple, and Red.

☐ Saturation refers to the strength of the particular hue and the extent to which the strength is "diluted" by some proportion of white. If your current color has a Saturation setting of zero, your color is necessarily white.

☐ Value refers to the amount of light a color reflects off a surface (and therefore, the absence or presence of black). A color with a high Value setting has little or no black, whereas colors with low Value settings contain more black. No matter what settings you've entered for Hue and Saturation, a Value setting of zero produces pure black.

In the requester, the RGB system uses a 16-point scale (0–15) for color values, while the HSV method uses two different types of measurement. Hue is is referred to in degrees of the Color Wheel (0—360°) and Saturation and Value are measured in percentages (0-100%).

(See *Tutorial One* in Chapter 4, ***Painting Tutorials***, for an explanation of color mixing in RGB or HSV.)

Use the COPY button to copy a color from your picture or the palette.

▶ Select the color you want to copy .

▶ Click COPY. TO appears attached to the cursor.

- ▶ Click the slot in the requester into which you want to copy the new color.

Use the EX button to exchange the positions of two colors in the palette.

- ▶ Select the first color from the row of colors.
- ▶ Click EX. TO appears attached to the cursor.
- ▶ Click the second color.

If you use EX to rearrange the colors in your palette, the resulting screen image will likely be in the wrong colors. You can correct this by choosing **Remap** from the Color menu.

- ❖ You should remap immediately after you change the color arrangement in the palette. If you modify the palette a second time without first remapping, you will not be able to remap to the original palette.)

SPREAD helps you quickly create a spread of shades between two colors.

- ▶ Select the first color from the palette.
- ▶ Click SPREAD. TO appears attached to the cursor.
- ▶ Click the second color.

DeluxePaint creates a uniform spread of colors, taking into account the beginning and ending shades and the number of colors in between in your palette.

Use PICK to select a new foreground or background color for your palette.

- ▶ Click PICK. The pointer changes to an eye dropper cursor. (You can also display the eye dropper cursor by pressing the comma key.)
- ▶ Position the point of the eye dropper on the color you want to become the new foreground or background color.
- ▶ Click to make the color you clicked on the new foreground color. Right-click to make it the new background color.
- ❖ To copy your new color into the palette, use COPY.

Use DELETE to remove one or more colors from the color set.

- ▶ Click a color you want to delete.
- ▶ Click DELETE. TO appears attached to the cursor.

If you want to delete only one color, click on that color in the color set. The color will be deleted and the slot it occupied in the color set will be empty.

If you want to delete more than one color, a range for example, click the first color in the range; click DELETE; move the TO cursor to the last color in the range; and click the color. DeluxePaint will delete all colors between the selected color in the sample-color box and the color you clicked on.

UNDO You can reverse the last change you made in the Color Mixer by clicking UNDO.

REVERT You can clear the changes you made in the Color Mixer by clicking REVERT. With the exception of the mixing area, this returns the requester to the condition it was in before you displayed the Mixer.

Color Mixing Area

Use the mixing area to interactively mix colors to create new ones, and, if you wish, add colors to your palette. You can use colors in the picture, colors from the palette, and colors you mix to create new shades. Using your current built-in or custom brush you can select colors from the palette (one at a time), paint with them in the mixing area, and mix them with other colors.

Creating a New Color

You can create a new color in the Mixing Area in two basic ways:

1. Mix a selected color in the mixing area with one or more other selected colors. The resulting color can be a new color.
2. Edit a color by adjusting its values with the RGB/HSV sliders.

Here's a step-by-step example of how to select a color from the current picture, edit it, mix it with another color, and add it to the palette.

Selecting a Color

▶ With a picture on your screen and the Color Mixer exposed, click the PICK action button.

▶ Move the PICK cursor to the picture and click on a color.

The color you clicked on automatically becomes the current foreground color. It appears in the sample-color box, so you can paint with it immediately. The color slot of the new color appears indented in the color set.

This color can be edited. To edit the color in the mixing area:

- Drag one or more of the RGB/HSV sliders to change the color values, which changes the color itself.

Mixing a Color

- Click a medium sized built-in brush and paint in the mixing area.
- Choose another color, and paint over the first color in the mixing area. As you combine the two colors, new shades are created. You can repeat this step as often as you like.
- When you have created a color you want to use, click the slot in the color set where you want to place the new color.
- Click the PICK button; click the color in the mixing area to make that shade the new color.

Clearing the Mixing Area

You can clear the Mixing Area to any color by copying the color to it. Here's how:

- Select the color you want to clear the Mixing Area to.
- Click COPY. TO appears attached to the cursor.
- Click the in the Mixing Area. It is cleared to the color you selected.

Arrange

Keyboard Equivalent: P
Shows the Arrange requester. It displays all 256 colors of a Color Set (4 rows [128 colors] at a time). Clicking on the up and down arrows scrolls through the color set one row at a time (32 colors in a row). Shift-clicking on an arrow scrolls 4 rows at a time. Arrange is helpful if you want to copy, exchange or spread colors over more than one row at a time. The Arrange requester will replace the Color Mixer if it is open.

Use the Arrange requester to organize colors in your palette or delete colors. It lets you delete colors easily, so that new colors can be added to the current 256-color set.

The action buttons in the Arrange requester work exactly as they do in the Color Mixer. See above.

Use Brush Palette

When you load a brush from disk, DeluxePaint continues to use the current picture palette, even though it may be different from the one the brush was created with. Use Brush Palette switches to the brush palette, and includes any information about color cycling that was saved with the brush. If the newly loaded brush uses more colors than the current picture, Use Brush Palette switches to the brush palette and reduces the number of colors to that of the picture palette. It does so by recomputing the palette to match the original as closely as possible with fewer colors. After choosing Use Brush Palette, you can still revert to the original picture palette by choosing **Restore Palette** (see below).

Compare Use Brush Palette with **Remap** in the Color menu; this command lets you keep the current picture palette, but maps the brush to the picture palette to match the original brush as closely as possible.

Restore Palette

Returns you to the palette you were using before the current palette. Thus, if you load a picture with a different palette, Restore Palette reverts to the palette in effect before the load. See also **Use Brush Palette**, above, and **Default Palette**, below.

Default Palette

The default palette is the palette DeluxePaint uses when you first start the program. The Default Palette command replaces the current palette with the default palette and resets any ranges you may have created to its (their) default state.

Load ...

Load a palette that you have previously saved, without loading an image. The Load Palette requester works just like the Load Picture requester (see **Load** under the Picture menu). When you load a palette, the palette colors overwrite your current palette directly. Compare this to loading a Color Set, explained below.

Save ...

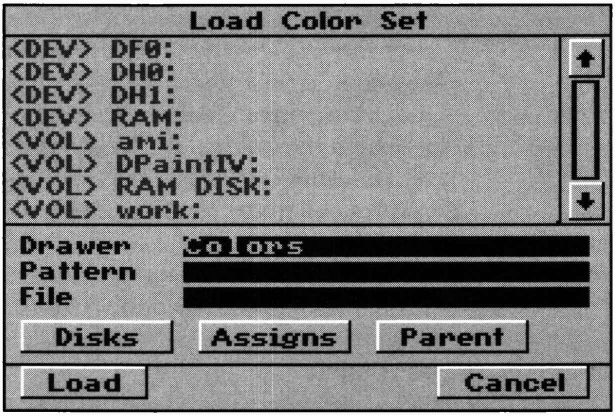
Save a palette without saving the image. The Save Palette requester works just like the Save Picture requester (see **Save** under the Picture menu). Only the Base Register colors (those colors that appear below the Toolbox) are saved, NOT the entire color set.

Color Set ▸

Load ...

Displays the Load Color Set requester. This requester works just like the Load Picture requester (see **Load** under the Picture menu).

Once you've selected the Color Set file you want to load and clicked Load in the first requester, a second Load Color Set requester appears.



```
<DEV> DF0:
<DEV> DH0:
<DEV> DH1:
<DEV> RAM:
<VOL> ami:
<VOL> DPaintIV:
<VOL> RAM DISK:
<VOL> work:
```

Drawer Colors
Pattern
File

Figure 8.36 Load Color Set Requester

This requester lets you choose which colors from the Color Set are to be loaded into your current color set. To select colors, click on them. Click on a color a second time to deselect it. The **All** button selects all colors in the Color Set. The **None** button deselects all colors. The **Base** button selects only the colors in the palette (base registers).

Once you have selected the colors you want to load, you can either **Add** them to your Color Set or **Overwrite** the current Color Set. If you choose Add, the colors are added beginning in the first empty slot of your current Color Set. Colors will be added only until the Color Set is full. If you choose Overwrite, the colors you have selected are entered into your current Color Set beginning at color 0 and the new colors overwrite the previously existing colors.

If you change your mind and decide not to load any colors, click **Cancel** in the requester.

Save ...

Saves a 256-color set as a separate file. The Save Color Set requester works just like the Save Picture requester (see **Save** under the Picture menu).

Bg ->Fg

Changes all pixels that use the current background color to use the current foreground color. This provides an easy method of changing colors globally — all pixels in the current background color in the picture are changed to the current foreground color. The change occurs on-screen only and does not affect the order of colors in the color palette.

❖ Undo does not reverse this change.

Bg<->Fg

Swaps all pixels in the current background color with the current foreground color. This is similar to the **Bg->Fg** option above, except that the change occurs in both directions. The change occurs on-screen only and does not affect the order of colors in the color palette.

❖ Undo does not reverse this change.

Remap

When you create a picture, DeluxePaint "remembers" each color on the screen by remembering its location in the palette. If a picture on the screen was created with a palette other than the current palette (for example, if you have modified the palette since loading the picture), Remap finds the locations in the current palette of the colors it used in the original palette and tells the picture to look there for its colors. **Bg->Fg** and **Bg<-> Fg**, above, are special cases of Remap. See also **Remap** under the Brush option of the Color menu, below.

❖ Undo does not reverse this change.

Recompute

This option is available in HAM mode only. Choosing this option recomputes the picture data by doing a remap with the current palette. If you have loaded a HAM image from a different program, Recompute may reduce the fringing effects you see when moving a brush across the screen.

Brush ▶

Use the options in the submenu to modify the current brush colors.

Bg ->Fg

Changes all pixels in the brush that are in the current background color into the current foreground color. This provides an easy method of making a global color change — all instances of the background color in the brush are changed to the current foreground color. Because you can select any color in the brush as either the foreground or the background color at any time, you can make intricate color changes easily. This operation affects the brush colors only and does not affect the picture or the order of colors in the palette.

Bg<->Fg

Swaps the current background color in the brush with the current foreground color. This is similar to the **Bg->Fg** option, except that the change occurs in both directions. The change affects the brush colors only and does not affect the picture or the order of colors in the palette.

Remap

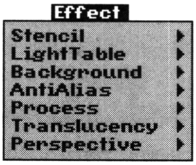
Use Remap when you load a brush that uses a palette different from the current palette. Remap looks at the colors used in the brush and tries to find the closest fit within the current palette. This option is different from Use Brush Palette in that it does not change the picture palette. Instead it changes the palette locations the brush looks at for its colors. You can perform this operation on AnimBrushes and all frames of the animated brush will be remapped.

Change Transparency

Lets you change the transparency of the currently selected brush to the current background color.

The Effect menu contains several special features. Its options let you create stencils, "freeze" the background, and define planes for drawing in perspective.

Effect Menu



Stencil ▶

Creating a stencil allows you to paint around an image without painting on it, as though it were protected by a frisket. Create a stencil of an image in either of two ways (painting and locking), or by using both ways together. You can "paint" an area to mask, see **Paint,** below, or "lock" the colors that comprise that image.

A stencil will also apply to the brush when it is captured. Whatever colors in the brush were locked when the stencil was made become transparent in the brush.

When you have a stencil active, an "S" appears in the Title Bar.

Show

Show dims the colors in your picture and displays the stenciled areas of your picture (if any) in a contrasting lighter color. The "S" in the Title Bar changes to "s."You can't paint on your picture while Show is active. Click to return to your picture.

Make ...

Keyboard Equivalent: ~ (tilde, below Esc)
This displays the Make Stencil requester. You can reposition the requester anywhere on the screen by dragging the Title bar.

To make a stencil:

- ▶ Click the colors you want to use to create the stencil. You can select colors by clicking them in the requester's palette, by clicking colors in your picture, or by clicking colors in the main palette.

When you have clicked all the colors you want to protect, click MAKE.

The colors you select define a mask that protects an area from being painted over. The shape of the stencil is what is created and saved, not the color information, which means you can change the colors of a "stenciled" shape, and still retain the stencil.

If you have several animation frames, DeluxePaint automatically remakes the stencil as you move from one frame to the next, either manually or while using the Move requester.

Clears the current color selections in the requester.

Inverts the current color selections. This is useful if you want to mask more colors than you want to leave unmasked.

When you are using HAM mode, your Make Stencil requester also contains a Show button, a Fine Tune button and a Tolerance edit field. These options are explained in detail, with examples, in Tutorial Four of Chapter 4, *The World of Stencils*.

Show toggles the show stencil function on and off. This works like the **Stencil>Show** option in the Effect menu.

Fine Tune lets you add or subtract individual colors from the stencil.

The Tolerance edit field lets you click on a single color in your picture and simultaneously lock (or unlock) all "similar" colors in the image. The Tolerance number determines how different a color can be and still be considered "similar" to the one you clicked on. A low Tolerance number requires that the colors be very similar, while a high Tolerance number locks colors that may be very different from the color you clicked. The range of Tolerance values runs from 0 to 48. At 0 tolerance, only colors that are identical to the color you click on will be affected. At 48 tolerance, all colors will be affected.

Remake

When you have a stencil active and you apply colors to your picture, the colors you apply are not protected, even though they may be locked in the Make Stencil requester. You can lock newly applied colors by bringing up the Make Stencil requester and clicking **Make**, or by selecting **Remake** from the Stencil submenu.

❖ If you have several animation frames and you make a stencil, DeluxePaint automatically remakes the stencil as you move from one screen to the next.

Paint

Keyboard Equivalent: Ctrl-s
Uses your current built-in or custom brush to paint the area you want stenciled. The image under the stencil will be displayed in a "half-tone" mode. When you've finished painting the stencil, choose **Paint** again to exit this mode and activate the stencil. Stencils you create using Stencil Paint are "area-based" and apply only to the current picture or frame. Also, if you choose **Make** or **Remake** to create a "color-based" stencil, your painted stencil is discarded.

Reverse

Has the same effect as clicking Invert in the Make Stencil requester (see **Make**, above).

On/Off

Keyboard Equivalent: ' (below Esc)
Toggles the stencil on and off. This maintains the stencil but turns it off temporarily so you can paint on the protected colors.

Free

Creating a stencil uses memory, even though you may have it turned off (see **On/Off**, above). Free deletes the stencil and deallocates the memory it was using.

Load ...

Stencils can be loaded as separate items. They are full screen only, and can be loaded only to the position they occupied when they were created. In other words, you cannot create a page larger than screen size and load the stencil into the middle of the page. The Load requester works like all other Load requesters in the program (see **Load** in the Picture menu).

❖ When you load (or save) a stencil, you are loading (or saving) only a layer of data that indicates which pixels in your picture you can or cannot paint on . You are not loading settings for the Make Stencil requester. In other words, stencils you load are area-based, like the stencils you create in the Stencil> Paint mode. Area-based stencils do not apply across animation frames and are replaced by color based stencils you subsequently create using the Make Stencil requester.

Save ...

You can save stencils just as you can any other file, such as pictures or brushes. The Save requester for stencils works like all other Save requesters in the program (see **Save** in the Picture menu). See the note above regarding the nature of the data you are saving when you save a stencil.

LightTable ▸

On/Off

Keyboard Equivalent: l
Turns the LightTable on or off. The LightTable lets you see the animation frames that immediately precede and/or immediately follow the current frame (or the spare page), which gives you greater control while creating your animation. This effect simulates the "onion skin" techniques used by traditional animation artists. By using a combination of LightTable options, you can see a maximum of four frames simulataneously (Next, current frame, Two Back).

The lighttabled frames appear behind the current image (in the BG color area) and can be dimmed to a darker color in all screen format modes except HAM.

Merge

Merges all of the currently viewed images into the current frame, and turns off the LightTable so you can see the result as it actually appears.

WARNING! ❖ You cannot UNDO this Merge command.

Dim

Keyboard Equivalent: Alt-l
When Dim is on, all frames displayed on the LightTable, except the current frame, appear dimmed. You can easily see at a glance, which frame you are working on. Dim is on by default. This option applies to all screen format modes except HAM.

❖ If you dim a frame that contains very dark colors, those colors may be difficult to see.

Two Back

Shows/hides the frame that is two back from the current frame in the LightTable. For example, if your current frame is number 3, then Two Back shows frame 1 on the LightTable.

Previous

Shows/hides the frame immediately preceeding the current frame in the LightTable.

Next

Shows/hides the frame immediately following the current frame in the LightTable.

Spare

Shows/hides the scratch page in the LightTable.

Background ▸

Fix

Fixes the background by "locking" the current picture. This allows you to draw on it without losing any of the background. You can erase any paint you apply after fixing the background by clicking CLR or by painting with the right mouse button.

❖ Fixing the background uses additional memory. When the background is fixed, no colors may be picked up from that background.

Free

This "unlocks" the background, and merges it with anything that was painted over it, so that clicking CLR will clear the entire picture. It also frees up the memory that was allocated to fixing the background.

Lock FG

The Make Stencil requester lets you create stencils based on colors in the palette. By locking a color, you make it impossible to paint on that color, wherever it may be on the page. By using a combination of Fix Background (see above) and Lock FG, however, you can define a stencil by area rather than color. When you select Lock FG, you define as a stencil those areas on the page that you have painted since fixing the background, regardless of the color of those areas.

Anti-alias ▸

Anti-aliasing is a smoothing process which eliminates or reduces the jagged edges apparent in lines that aren't precisely vertical or horizontal. The effectiveness of anti-aliasing is dependent on the range of colors in the palette. For example, to draw a smooth, oblique black line on a white background, you'll need to have two intermediate shades of gray in the palette.

Anti-aliasing works with straight and curved lines, and with filled and unfilled shapes, It is especially good at smoothing the jagged lines in a brush that result from rotating or shrinking it in Perspective mode.

None, Low, High

Keyboard Equivalent: Alt-/
Set the level of anti-aliasing used on your brush when you paint. None is the default setting and applies no anti-aliasing. Low lets you eliminate some of the jagged outline in your images and brushes. The cost of removing jagged lines is painting speed, but it is still faster than smoothing out an image by hand. To use

anti-aliasing, select either Low or High before you lay down the brush image. Anti-aliasing is most effective when you have reduced the size of your original brush (for example, by moving it back along the Z axis). Anti-aliasing in the High setting can be very slow if your brush or fill area is large.

Process ▶

- ❖ The effectiveness of the Process options is dependent on the colors available in the palette. DeluxePaint combines your foreground color with the color in your image and then looks for the color in your palette that most closely matches the color it needs. For best results, your palette should contain a range of colors between the colors in the palette and the color you are using to tint. The Process options obviously give the best results in HAM mode because all 4096 Amiga colors are available for painting.

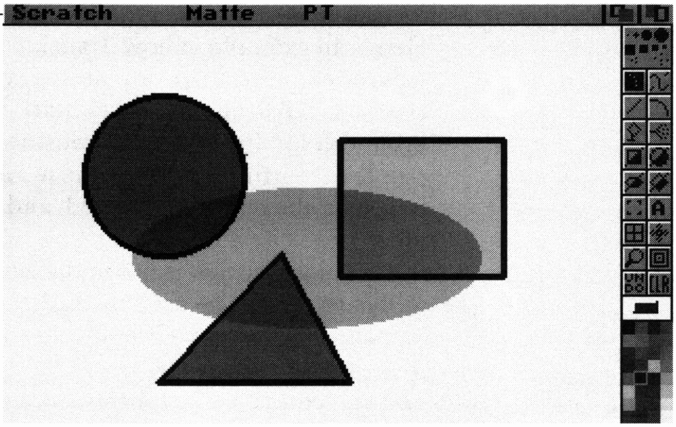
You can combine Translucency with any of the Process options to increase your control over the effect of these options. For example, Hue would normally directly substitute the hue of your brush for the hues in your picture. If you turn on Translucency with a setting of 50%, instead of substituting the hue directly, the resulting hue will be a 50/50 combination of the brush hue and the picture hue.

On/Off

Keyboard Equivalent: Alt-p
When you choose **Process On,** a P appears in the middle of the Title Bar.

Tint (default setting)

The color you are painting with tints the color(s) underneath it in the direction of the color you are applying. Use this option if you want to create a shading or tinting effect over a number of colors on the screen or to colorize a black and white or grayscale image.



Title Bar shows that Spare Page, Matte Brush mode, Process (Tint setting by default), and Translucency are active.

Figure 8.37 Shape painted over others using Tinted setting

Hue

Use this option with any painting tool to adjust the hue of a colored area of your image. This option is useful for converting a multi-colored image into a monochromatic image. Note that this option will have no effect on grayscale images because a color with no Saturation is gray regardless of its hue.

Value

Use this option to paint the Value of the current brush into the colors in the image. This is an effective way to create shading effects. If you choose a light color to paint with in Value mode, darker colors you paint on will become lighter. If you choose a dark color to paint with, lighter colors will become darker.

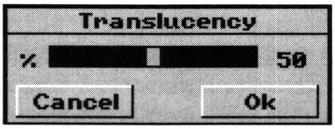
Translucency ▶

On/Off

Keyboard Equivalent: Alt-t
When you choose Translucency, a T appears in the middle of the Title Bar. Painting with Translucency on has the effect of laying a transparency or colored filter over a portion of your picture. The transparency is tinted toward the current foreground color. The degree of tinting is determined by the level (percentage) set in the Translucency requester (below).

Settings ...

Keyboard Equivalent: Ctrl-t
Displays the Translucency requester. The default setting is 50%.



% 50

Figure 8.38
Translucency requester

To change the setting, click on either side of the slider , or drag the slider to a particular position. Click Ok to confirm your new setting.

Here's an example of how Translucency works. Let's say you have a red object in your painting with the RGB values R: 15 (100%) G:0 B:0, and that blue (R:0 G:0 B:15 (100%) is your foreground color. If you set the translucency level to 50% and painted over the red object, the resulting color would be equal to 50% of the object's color, red, and 50% of the foreground color, blue. The RGB value of the resulting color is R:7 (50%) G:0 B:7. If this color (purple) is not in the current palette, the closest color to this value will be used instead. Like the Process functions, Translucency give the best results in HAM mode.

The percentage value for translucency refers to the amount of the original object that will show through the newly applied foreground color. For instance, in the above example if the translucency level was set to 75%, the resulting color would be 75% of the existing color in the painting, red, and 25% of the foreground color, blue. The RGB value of the resulting color would be R:11 G:0 B:3.

Translucency works with all the painting tools (except text, single pixel Airbrush, or the 3- and 5-pixel built-in brushes), and in combination with the **Process** options. By combining Translucency with **Tint**, for example, you can control the degree of tinting.

Perspective ▸

The Perspective submenu contains options for manipulating a brush in three dimensions.

Do

Keyboard Equivalent: Enter (on keypad)
Puts you into Perspective mode. Your brush is represented by a four-cell matrix, which you can manipulate with keypad commands (listed later in this section). The amount of rotation for axes x, y, and z is given in degrees on the right side of the Title bar. The center of perspective (see **Center**, below) is indicated by a cross-hair. You can paint an image of the rotated brush at any time by clicking.

❖ To exit Perspective mode, click a tool in the toolbox.

FillScreen

Keyboard Equivalent: - (minus on keypad)
Fills the screen with the current brush, in its current state of rotation in 3D. The entire brush size (not just the opaque part) is the default size for the Perspective Fill pattern.

Reset

Keyboard Equivalent: 0 (on keypad)
Resets the brush to its original state before rotation, and returns all of the settings in the Perspective Settings requester to their defaults (see **Settings**, below).

❖ **Note:** The keyboard equivalent does not reset the perspective center. It is useful if you need to reset your brush to its original orientation without changing your perspective plane.

Center

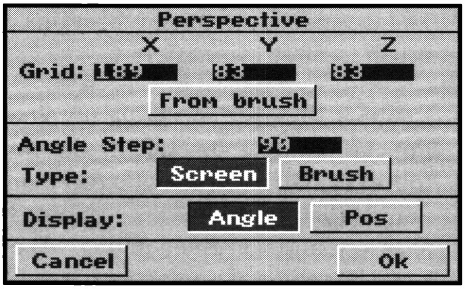
Keyboard Equivalent: . (period on keypad)
Allows you to set the Perspective center or horizon in your perspective "landscape."

❖ When you select Center, your cursor changes into a large cross-hair. The smaller, stationary cross-hair on the screen indicates the existing center. Move the large cross-hair to the new center you want and click either mouse button.

Once you have set the Perspective center, the position of the unrotated brush relative to that center determines the position of the perspective plane when you rotate the brush. The greater the distance above or below Perspective center, the less pronounced the perspective effect.

Settings

Displays the Perspective requester. When you are in Perspective mode, you can also display this requester by right-clicking the Grid tool.



Grid: 189 83 83

Angle Step: 90

Type: Screen

Display: Angle

Figure 8.39
Perspective requester

The following options are available:

Grid

You can use these edit boxes to set the dimensions for a grid in three-dimensional space. When you first open the requester, the numbers in these boxes correspond to the dimensions of your brush; the Z dimension automatically takes the same value as the Y dimension. It is important to remember that the entire brush size (not just the opaque part) is the default size for Perspective Grid and Perspective Fill.

From Brush

Clicking From Brush sets the X and Y grid values to correspond to the width and height of the brush. This is the quickest way to restore the perspective grid settings to the same dimensions as your brush without affecting any other settings.

Angle Step ⇧

Specifies the rotation increment used in conjunction with the Shift key and the appropriate keyboard rotation key (see *Perspective Rotations,* below). This value defaults to 90°.

Screen

The default setting, uses the screen coordinate system when rotating the brush on the X, Y, and Z axes. (If you are familiar with coordinate systems, you will know this coordinate system as the Euler method, which measures all three angles of rotation from absolute zero.)

Brush Rotates the brush relative to the current brush coordinate system.

Display The **Angle** and **Pos** buttons let you choose whether the angles of rotation or the position of the brush in three dimensional space are displayed in the Title Bar.

❖ If **Coords** from the Prefs menu is turned on, the Title Bar shows two dimensional coordinates; be sure to turn **Coords** off if you want to see three dimensional coordinates.

Perspective Rotations

All perspective rotations are controlled through the keypad on your keyboard.

	-1°	+1°	reset
X rotations	7	8	9
Y rotations	4	5	6
Z rotations	1	2	3
reset all rotations		0	
place center		.	
FillScreen		-	

Figure 8.40 Perspective rotation and settings using the keypad

⇧

	-Angle Step°	+Angle Step°	Fix Axis
X rotations	7	8	9
Y rotations	4	5	6
Z rotations	1	2	3
reset all settings		0	
place center		.	
FillScreen		-	

Figure 8.41 Perspective rotation and settings using Shift with the keypad

Pressing Keypad 0 resets all three axes to zero and fixes the Z axis (see below), but retains the apparent distance settings. Pressing Keypad 0 in conjunction with the Shift key resets all perspective values to the default state.

Other Perspective Keyboard Commands

Ctrl temporarily fixes the Y axis so that you can move the brush forward or backward in 3D space by moving the mouse forward or backward.

The ; and ′ keys move the brush plane forward or back along its fixed axis (see below) without changing its orientation, moving it in a direction perpendicular to the brush plane. This is the same effect described in the above discussion on brush position prior to rotation. Thus, with the Z axis fixed, brush position relative to the Perspective center at the moment of rotation determines the brush's distance above or below eye level. You can achieve the same effect after the brush is rotated by using the ; and ′ keys to move it forward or back along its Z axis.

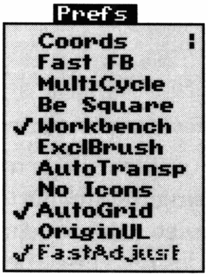
Pressing these keys with the Shift key held down results in larger increments of movement. In addition, you can modify the apparent distance from the observer by pressing the < and > keys (i.e., the Shifted "," and "." keys). Thus, when the apparent distance is great, the perspective foreshortening is at a minimum, becoming greater as apparent distance decreases.

Fixing Axes: Whenever you start in Perspective mode, the Z axis (the one perpendicular to the screen) is "fixed," that is, the mouse does not move the brush through that axis. You can selectively fix any axis, as follows:

To fix the X axis, press Shift-9
To fix the Y axis, press Shift-6
To fix the Z axis, press Shift-3

As noted above, you can move along the axis that is currently fixed by using the Shifted or un-Shifted ; and ′ keys (use the Shifted keys for larger increments). You can also temporarily fix the Y axis by holding down the Ctrl key.

Prefs Menu



The Prefs menu contains a list of options that you can toggle on or off to suit your work habits. When you choose an option, a check mark (√) appears to the left of the option to indicate that it's turned on. Choosing the option again turns the option off and removes the √.

You can toggle multiple options by clicking on the option while the Prefs menu is exposed.

The **AutoGrid** is turned on by default for all DeluxePaint users. For artists using HAM screen format, **FastAdjust** is also turned on by default.

Customizing the Prefs Menu

You can customize your working copy of DeluxePaint so that the preferences are automatically set to the way you like them each time you start the program. For example, you might like to have **Coords** always turned on when you boot DeluxePaint. To customize the preferences, use the Tool Types feature of Info in the Amiga Workbench. Here's how to do it under Workbench 1.3.

▶ Boot your Amiga. Insert your working copy of the program disk. Click the DeluxePaint program icon to select. Choose **Info** from the Workbench menu.

The Info requester appears. In the bottom half of this requester you'll see a box for Tool Types with ADD and DEL buttons. To turn a Prefs option on:

▶ Click the ADD button. Type the name of the Prefs option you want to turn on automatically each time you boot the program. (Type it exactly as it appears in the Prefs menu.) Press Return.

To turn a Prefs option off, scroll to display that preference name in the edit box and click DEL.

▶ Click Save to exit the Info requester and save your changes.

Coords

Keyboard Equivalent: Shift-\
This option turns on the coordinate display in the upper right-hand portion of the Title Bar. Simply moving the mouse displays the current position of the cursor, with the origin (0, 0) set to the lower left corner of the screen. Holding down either mouse button temporarily resets the origin to the current cursor position and displays the displacement value from that temporary origin

as you move around the screen. The readout is scaled in pixels. See also **OriginUL**, below.

Fast FB	Fast feedback. Turn on Fast FB when working with large or complicated brushes while using the line or unfilled shape tools. Fast FB lets you draw your lines or shapes using the smallest (one-pixel) brush for feedback, and then completes the design using the currently selected brush. This increases response speed while you are drawing, but does not affect the final image.
MultiCycle	Works in conjunction with the **Cycle** paint mode from the Mode menu. With MultiCycle turned on, painting with a multicolored brush in **Cycle** mode cycles each color in the brush, provided the color is in a cycle range. When MultiCycle is turned off (the default), using **Cycle** with a multicolored brush treats the brush as though it were a single color (the current foreground color).
Be Square	Because the Amiga's pixels are not perfectly square, circles and squares drawn with the shape tools are not perfectly round or square. If you wish to draw "true" circles or squares, select Be Square. This will square all the built-in brushes, the appropriate shape tools, and symmetry. Be Square does *not* square gridding or perspective, and should be turned off when you are using those features.
Workbench	Toggles the Amiga Workbench on and off. Default setting is off.
ExclBrush	If you pick up a brush with ExclBrush (and the Grid) selected, you will exclude a one-pixel border on the right and bottom edges of your brush (see Figure 30). This is useful if your brush has a colored border around it and you want to use the brush to create a pattern fill or perspective fill (using the Fill Type requester). When DeluxePaint creates your pattern, the border will be uniform throughout instead of being twice as wide where one copy of the brush is placed next to another. ❖ ExclBrush has no effect on brush pickup when the Grid is off.

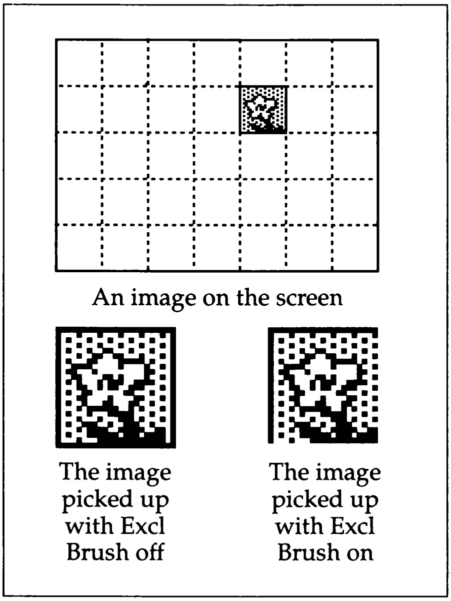

An image on the screen
The image picked up with Excl Brush off
The image picked up with Excl Brush on

Figure 8.42 An example of using ExclBrush

AutoTransp

Modifies the way brush pickup works. With AutoTransp turned on, DeluxePaint determines the transparent color by looking at the corners of the captured rectangle or the points of the polygon to see if they are the same color. If the four corners are the same color, that color becomes the transparent color, otherwise the current background color remains the transparent color.

No Icons

When No Icons is on, your files are saved *without* the icon "info" files. This option is useful if you don't ever expect to launch an application by double-clicking on a picture file. Saving without the icons saves space on your disks.

AutoGrid

With AutoGrid turned on, the perspective grid is resized automatically to match any custom brush you choose to load or pick up. It's as if you had clicked the From Brush action button in the Perspective requester. When AutoGrid is off, the perspective grid is not automatically resized.

❖ This option affects *only* the grid in Perspective, not the standard grid.

OriginUL

When **Coords** from the Prefs menu is on, DeluxePaint displays the current position of the cursor on the right side of the Title Bar. By default the program calculates the origin, or zero point of coordinates (0, 0) of the cursor position from the lower left corner of the screen. If you would rather have the origin calculated from the upper left, choose OriginUL. To return to the default origin, choose OriginUL again.

FastAdjust

This option is available only in HAM mode, where it is turned on by default. FastAdjust tells DeluxePaint NOT to attempt to correct the fringing effects that appear along the right side of your brush while the brush is moving. This improves the speed of brush movement and is especially helpful if you are using large custom brushes. If you find the fringing to be annoying or difficult to work with, turn FastAdjust off, and the fringing will be reduced.

User Feedback in the Title Bar

DeluxePaint Color

Figure 8.43 Title Bar

Painting Mode

Displays the the current painting mode (Matte, Color, Replc, Smear, Blend, Cycle, Smooth) beside the program title [DeluxePaint] on the Title Bar. See Mode menu, above, for information on painting modes.

Color Fill Box

Displays the currently selected fill pattern, or perspective fill or gradient fill in a small box in the middle of the Title Bar. This box previews the pattern or gradient you'll get when you fill a shape. The Color Fill Box is absent if your Fill Type is set to Solid. See discussion under **Fill tool**, below, for more information on the Fill Type requester.

A Appears in the middle of the Title Bar when **Antialias>High** is selected from the Effect menu.

a Appears in the middle of the Title Bar when **Antialias>Low** is selected from the Effect menu.

B Appears in the middle of the Title Bar when the *background is fixed*.

P Appears in the middle of the Title Bar when you have selected one of the Process options (Tint, Hue, Value) from the Effect menu. **Process>None** does not display the P.

S Appears in the middle of the Title Bar to show a Stencil is active.

s Appears in the middle of the Title Bar when a Stencil is active, and **Stencil>Show** or **Stencil>Paint** is selected.

T Appears in the middle of the Title Bar when **Translucency** from the Effect menu is turned on.

Axis Rotation

When you are in Perspective mode, the rotation of the selected shape about each axis (x, y, and z, respectively) appears in the right corner of the Title Bar. The axis rotation information is superseded by the cursor coordinates if you turn on Coordinates in the Prefs menu.

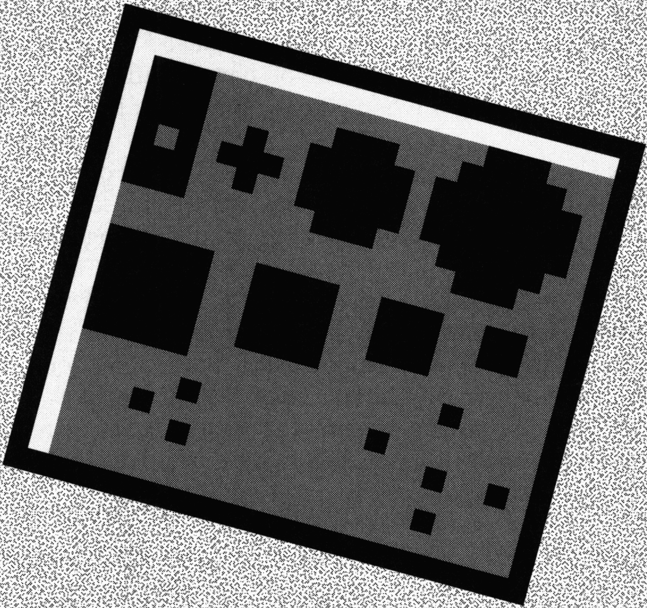
Coordinates

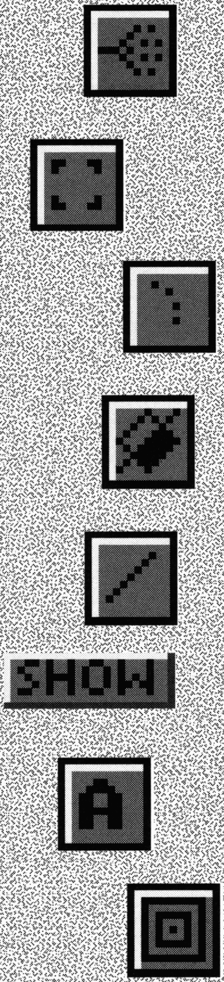
When **Coords** is active, the coordinates of the cursor position are displayed in the right corner of the Title Bar.

Memory Availability

Press the Ctrl key and the letter **a** at the same time to display available Fast memory/Chip memory in the left corner of the Title Bar. See ***Appendix A*** for information on DeluxePaint's memory usage.

Notes





Appendixes

Appendix A: Memory Management

If you're running DeluxePaint IV on a machine with 1 megabyte of RAM, 282K is allocated to the program and 100K to Intuition, leaving about 600K free. But this doesn't take account of the memory required to create the display, so you'll generally have a little less memory available as you work. For example, the default screen format (320 x 200 by 32 color display) uses 40K of memory, which leaves you with about 560K to work with. In addition, each external disk drive uses an extra 20K. You can measure available memory by selecting **About** from the Picture menu (or by pressing Ctrl-a) any time you need a memory check. DeluxePaint will warn you when you have insufficient memory to accomplish a task, or when you run the risk of losing data.

Memory shortage is manifested in various ways. For example, if you are at the limits of available memory and you select a large brush, DeluxePaint conserves memory by displaying just the outline of the brush. When you paint with the brush the image will appear on the screen in the normal fashion, even though it may not be visible as you move the brush around the screen. When this happens, consider it a sign that available memory is low. In that case, you should take some action to reallocate memory (for example, by deleting the spare page or by removing any stencils, see below), or at least to save your current image or animation to disk.

Here are some of the ways DeluxePaint IV consumes memory:

- ☐ Increasing the amount of change in an animation *after* you've allocated frames for animation (see below for further discussion).
- ☐ Creating and holding a large brush. When you see just the outline of the brush this is a sign that you are near the edge of your memory limits.
- ☐ Creating and holding a large AnimBrush.
- ☐ When your spare page is active, it uses up as much memory as the first page even if you cleared the image from it. You can regain the memory used by the spare page (40K or more) by selecting **Delete This Page,** while viewing the spare page, from the Picture menu.
- ☐ You use memory by leaving the WorkBench open while you work DeluxePaint. The WorkBench can be opened and closed through the Prefs menu.

☐ Creating a stencil uses up one bit plane. The exact amount of memory used depends on the screen format and page size you've selected. Fixing the background has a much larger overhead, similar to that required by a spare page.

Other things that require memory are loading the disk directory, loading the system fonts, and creating a fill pattern from a brush.

Animation and Memory Management

You've probably discovered that animation requires a lot of memory. And the two animation methods, **Expanded** and **Compressed**, have different memory requirements.

The Expanded method of animation requires that there be enough memory to duplicate the entire screen for every frame. So if you are in 320x200 32 colors, which takes 40K per screen, you'll need 800K to get 20 frames.

Memory requirements for animation in the Compressed mode is based on the difference between each animation frame. The more a frame is different from the one before it, the more memory will be needed to store it in memory and on the disk. The frame that requires the minimum amount of memory is simply a copy of the frame before it. The maximum amount of memory is required when every pixel in a frame is a different color than in the frame before it.

It's possible to set the number of frames to a large number and then, in the course of painting on the different frames, run out of memory. What is happening is that you are increasing the amount that the frames differ from each other. When this happens you'll see a message that explains that you don't have enough memory to save the changes you're making.

What If You Run Out of Memory

Eventually everyone gets in a situation when they run out of memory. The first thing you should do when you get messages saying "Not enough memory" is to save your work. The following is a list of things you can do to get a little more memory to finish your work.

☐ Close the Workbench from the Prefs Menu.

☐ Delete your Spare page.

☐ Delete your custom brush by selecting a very small custom brush.

☐ If you have an AnimBrush, choose **AnimBrush>Free** option from the Anim menu to free it.

☐ If you have a stencil, choose **Stencil>Free** from the Effect menu to free it.

☐ If you have an animation, delete some frames.

☐ Reduce your page size if it is larger than the screen.

☐ Work with the minimum number of colors that you can to achieve the effect that you want. Choose the screen format you are working with and reduce the number of colors.

❖ If you receive the System Message "Not enough memory for requested page size" when you try to change the DeluxePaint IV screen format from Hi-Res, 16 colors to Hi-Res, 16 colors, Overscan, you may be experiencing memory fragmentation. To solve this problem, either reset the screen format from the **Screen Format** option in the Picture menu, or quit the program and restart DeluxePaint IV in Hi-Res, 16 colors, Overscan mode.

Appendix B: Keyboard Command Summary

Brush Commands

F1	Matte
F2	Color
F3	Replc
F4	Smear
F5	Shade
F6	Blend
F7	Cycle
F8	Smooth
-	Brush smaller
_	Custom brush smaller by 2 steps
=	Brush larger
+	Custom brush larger by 2 steps
Alt-n	Copies custom brush to spare brush
Alt-b	Swaps current and spare custom brush
Alt-m	Metamorphosis from spare to current custom brush
Z	Stretch
h	Halve
H	Double
X	Double horizontal
Y	Double vertical
x	Flip horizontal
y	Flip vertical
z	90 Degree rotate
o	Edge>Outline
O	Edge>Trim
Alt-s	Center brush handle
Alt-x	Flip brush handle horizontal
Alt-y	Flip brush handle vertical
Alt-z	Place brush handle

Toolbox Commands

b	Brush Selector
B	Restore last custom brush/AnimBrush
c	Unfilled Circle
C	Filled Circle
i-c	Filled and Outlined Circle
d	Continuous Freehand
D	Filled Freehand
i-d	Filled and Outlined Freehand Shape
e	Unfilled Ellipse
E	Filled Ellipse
i-e	Filled and Outlined Ellipse
f	Fill
F	Fill requester
g	Grid on/off
G	Grid on/off using current brush handle position as a grid point
K	CLR (clear screen)
m	Magnify on/off
p	Palette Mixer requester
P	Arrange Palette requester
q	Curve
r	Unfilled Rectangle
R	Filled Rectangle
i-r	Filled and Outlined Rectangle
s	Dotted Freehand
t	Text
T	Choose Font requester
u	Undo
v	Straight Line
V	Line Spacing requester
>	Increase magnification
<	Decrease magnification
,	PICK color cursor
.	One-pixel brush
[,]	Change foreground color
{, }	Change background color
/	Toggle Symmetry on/off

Special Keys

?	Display About/memory info box
Delete	Cursor arrow on/off
F9	Menu Bar on/off
F10	Toolbox & Menu Bar on/off
Shift-F10	Hide all panels (Toolbox, menu, etc)
Cursor keys	Scroll Page (except in text mode)
Ctrl-Cursor Keys	Adjust Screen positioning (Adjusts the position of Mixer, Arrange Palette, and Range panels when the cursor is over the panel)
n	Centers area under the cursor
Shift	Constrain cursor
Ctrl	Leave traces with line or shape tools
Ctrl-a bar	Displays available Memory in the menu
Tab	Color Cycle on/off
S	Show page
Ctrl-S	Toggle Paint Stencil mode
~ (Tilde)	Make Stencil
` (Grave)	Stencil on/off
a	Again key - repeats last menu command
| (Shift-\\)	Coords on/off
Spacebar	Cancel operation in progress
Esc	Stop operation in progress
j	Spare page
Ctrl-j	Copy to Spare
Alt-/	Step through Antialias settings
Help	Selects Freehand tool and single pixel brush
Right Amiga-l	Load requester
Right Amiga-s	Save requester
Right Amiga-d	Delete requester

Color Controls

Ctrl-r	Range requester
Alt-r	Reverse direction of range
Alt-] and **Alt-[**	Step forward/backward through available ranges
Alt-t	Translucency On/Off
Ctrl-t	Translucency Setting requester
Alt-p	Process On/Off (Tint is default)
p	Color Mixer requester
P	Arrange Palette requester

Perspective Commands

Enter	Enter/Exit perspective mode
Keypad 7 and 8	Rotate about the X axis
Shift Keypad 7 and 8	Rotate X axis by Angle Step
Keypad 9: Reset X axis to 0°	
Keypad 4 and 5	Rotate about the Y axis
Shift Keypad 4 and 5	Rotate Y axis by Angle Step
Keypad 6: Reset Y axis to 0°	
Keypad 1 and 2	Rotate about the Z axis
Shift Keypad 1 and 2	Rotate Z axis by Angle Step
Keypad 3: Reset Z axis to 0°	
Keypad 0 Reset all axes to 0°	
Shift Keypad 0	Reset all axes, positions, and settings
Shift Keypad 9	Fix X axis
Shift Keypad 6	Fix Y axis
Shift Keypad 3	Fix Z axis
Keypad "-" (Minus)	Fill the screen with the current brush at the current perspective
Keypad "." (Period)	Reset Center
; and # keys:	Moves the brush along its fixed axis in a direction perpendicular to its plane
Shift ; and # keys (: and @)	Same as ; and # keys but with greater increment
< (Shift ,) and > (Shift .)	Modify observer distance from screen
Ctrl	Temporarily fixes the Y axis so you can move your brush on the x and z coordinates
\	Toggle Angle/Position display

Animation Keys

1	Step to Previous Frame
2	Step to Next Frame
3	Display the Go To Frame requester to jump directly to a specific frame
4	Play Animation continuously until Spacebar or mouse button is pressed
5	Play animation once
6	Play animation in ping-pong mode
7	Step to previous AnimBrush cel
8	Step to next AnimBrush cel
Shift-1	Go to first frame
Shift-2	Go to last frame
Shift-3	Go to last frame you did a "go to" to
Shift-4	Play animation continuously in reverse direction
Shift-5	Play animation sequence once in reverse direction
Shift-7	Go to first AnimBrush cel
Shift-8	Go to last AnimBrush cel
Space bar	Stop the currently playing animation sequence
r	Reverses animation sequence while playing
Left Arrow	Slows down animation while playing
Right Arrow	Speeds up animation while playing
Alt	Held down while painting, turns on Animpainting mode
M	Move Requester

Animation Control Panel

Alt-a	Anim Control Panel on/off
l	LightTable on/off
Alt-l	LightTable Dim on/off
Ctrl-1	(main keyboard) LightTable 2 back on/off
Ctrl-2	LightTable Previous on/off
Ctrl-3	Lighttable Next on/off
Ctrl-4	LightTable Spare Page on/off
Alt-=	Adds one frame

Appendix C: The Player Utility

The Player utility on the Art2 disk lets you play the animations you have created with DeluxePaint IV. You can boot the utility from the Workbench or use CLI arguments to start the Player.

From the Workbench, open the Art2 disk and double-click on the Player icon. This loads the program in the default screen format (lo-res, 320 x 200, with 32 colors). The screen is black and the Menu Bar is not displayed. To see the utility's single menu, move the pointer to the upper left part of the screen and press the right mouse button. **Animate** appears in the Menu Bar, and the menu options, **Load**, **Play**, **About**, and **Quit** descend below it.

Choose Load and when the Load Anim requester appears, specify which drive you want to make active and then load a picture or anim from the directory of the drive you chose. The utility automatically plays the highlighted file when you click Load in the requester. If you want to replay the animation after you have stopped it, choose **Play**. **About** displays the version and date of the utility. To exit the Player and return to the Workbench, choose **Quit**.

You can use the same keyboard commands you've used in DeluxePaint IV while you view your animation.

KEY	**EFFECT**
Tab	Turns color cycling on/off
Left Arrow	Slows down play rate
Right Arrow	Speeds up play rate
r	Reverses play direction
Esc or Space bar	Stops plays
1	Go to previous frame
2	Go to next frame
4	Play the animation
5	Play once
6	Play ping-pong

To use Player from the CLI or Shell, open the CLI or Shell from the Workbench. On the command line type `cd Art2:` and press return.

❖ If Art2 is not loaded you will be prompted to insert it.

This will change the current directory to the Art2 disk where the Player utility is located. At the next prompt, type `player` (add a space) and the complete path and filename of the picture or anim you want to load. For example, if you wanted to load the animation called "TheTour" from the anim drawer of the Art2 disk, you would type the following

```
player Art2:anim/TheTour.anim <enter>
```

If you want to show the anim for a certain number of seconds, press the *space bar* and type that number after the filename. For example, to play "The Tour" for five second type:

```
player Art2:anim/TheTour.anim 5 <enter>
```

If you would like to indicate that the number is a loop count instead of time in seconds, press the *space bar* and type the number of loops you want to run. Press the space bar again and type `loops`. For example, to play five loops of "The Tour" type:

```
player Art2:anim/TheTour.anim 5 loops <enter>
```

You're now ready to issue player commands for your animation (or you can press Return right now and your animation will play and take you back to the CLI when it's finished).

If you type an @ before the filename in the first line, the filename must be the name of a script file. Script files are ASCII text files from which commands are read. They are created with a text editor such as ED or EMACS, both of which are included with Workbench 1.3.

To instruct the Player utility to read commands from the script file (we'll call the filename TEST) type:

```
player scripts/@test
```

Play Commands from CLI or Shell

Command	Meaning
player	Load the Player
player (path & filename)	Load and/or play file
player (path & filename) 10	Load and/or play file for 10 seconds and exit back to CLI or Shell
player (path & filename) 20 loops	Load and play file for 20 loops and exit back to CLI or Shell
player @test	Read commands from script file "test"

Script File Commands

The script commands, one per line, are similar to the CLI commands except that the word "player" is omitted.

Command	Meaning
filename	Display *filename* for 5 seconds
filename	Display *filename* for 10 loops
filename	Play *filename* until user hits key
filename	Display *filename* until user hits key

❖ If the animations or pictures you are displaying are not in the same drawer as the Player, you must specify a complete path before the filename.

If you hit the *space bar* or click while a picture or anim is running, the program will move to the next command, even if the specified play-time has not elapsed.

File names with blanks must be enclosed in quotation (" ") marks.

A command line starting with a ; (semi-colon) is skipped.

Creating an Autobooting Slide Show

This following information is included for Advanced Users who are familiar with AmigaDos and want to create an Autobooting Demo that displays your pictures and animations from a script file. The whole process takes between 15 to 30 minutes.

1. Boot up your system with a Workbench disk.

2. Format a blank disk using the noicons parameter.

3. Use the Install command to make the empty disk a boot disk. For example, if the empty disk is in df1 type:

   ```
   INSTALL df1:
   ```

4. Make the following directories on the empty disk using the Makedir command: c ; libs ; s ; l
   Example: Makedir df1:c

5. Copy the following commands from your workbench to the c directory of your empty disk: c:endcli ; c:loadwb ; c:setpatch
   Example: Copy c:endcli to df1:c

6. Copy the file Icon.Library from the Workbench libs directory to the empty disk's libs directory.

7. Copy the file Disk:Validator from the Workbench l directory to the empty disk's l directory.

8. Copy the Player and Player.info from the Art2 disk to your empty disk. Since in fact your disk is no longer empty we'll call it your Player Disk from here on out.

9. You should now have more than 700K free on your Player Disk for your pictures and animations.

10. To execute the script file you will be writing to show your pictures and or animations you will need to first create a Startup-Sequence file in the S directory of your Player Disk. To do so, you must create a text file called Startup-Sequence with the following commands. Type the commands word for word and line for line.

    ```
    c:setpatch > nil:
    player @demo
    loadwb
    endcli > nil:
    ```

    You can create this Startup-Sequence file using Ed, MicroEmacs, or any text file editor.

11. Copy the pictures and or animations you want in your demo to your player disk. Note that all of this copying can be expedited if you you use a workbench directory utility. There are several in the public domain directory utilities and commercial ones as well.

12. Create a script file called demo using the parameters given to you earlier in this section.

13. After you've completed all these steps, you should be able to insert your Player Disk into the internal drive of most Amigas at the Workbench prompt (after rebooting) and watch your demo go.

Appendix D: Amiga Display Modes

DeluxePaint IV supports all of the built-in Amiga graphic display modes — low resolution, high resolution, extra-halfbrite, and hold and modify. You don't need to know much about the different display modes to create great art with DeluxePaint IV. But some understanding of how the display modes work, and in particular, how they affect the number of colors available in the palette, can help you work more effectively.

This appendix explains how a pixel derives its color, and how the display mode and the number of bit planes determine the number of colors available in the palette. We've tried to avoid overly technical explanations, but the material is still very technical. If you don't understand everything you read here, don't be discouraged, just remember that you don't really need to know this.

What Is a Bit Plane?

A bit plane can be thought of as a flat grid of dots — a plane of dots, where each dot represents a bit. So when we say "bit," think dot.

If you look ahead to Figure D-1, you'll see that we drew the bit planes as flat surfaces. The best way to think of this surface is as a flat grid behind your computer screen. (This isn't actually how it works, but it may help you visualize how the colors are assigned to pixels.) The grid is the same dimensions as your screen resolution. For example, if your screen is 320 pixels wide and 200 pixels high, each bit plane is also 320 x 200 bits.

Bit Planes and Available Colors

Now imagine that each dot is either filled in or it's not. If the dot is filled in, it has a value of 1 and is said to be "on." If it is not filled in, the dot has a value of 0 and is said to be "off." In the simplest case of a display mode with only one bit plane, the picture can have only two colors. A pixel is one color if its corresponding bit is on or a different color if the bit is off.

The bit planes themselves don't determine the color of the pixel, they simply determine which color register the pixel looks to for its color. With a single bit plane, the pixel points to either Color 0 or Color 1. If you add another bit plane behind the first, the number of possible color registers doubles to four. Each additional bit plane doubles the number of colors again. The color register contains the numbers for the amount of red, green, and blue in the color.

Low Resolution and High Resolution Display Modes

Figure D-1 illustrates how the bit planes determine which color register a pixel points to in Low Resolution display with five bit planes. Take a look at this figure for a moment. Notice that we've numbered the bit planes 0 through 4. Notice also that the number of each bit plane corresponds to the power of two by which each bit plane value is multiplied. For example, the dot in bit plane 3 has a value of 1, and because it is in bit plane 3, the 1 is multiplied by 2^3, which equals 8 (2 x 2 x 2). The numbers from the five bits are then added together to obtain the number of the color register the pixel points to.

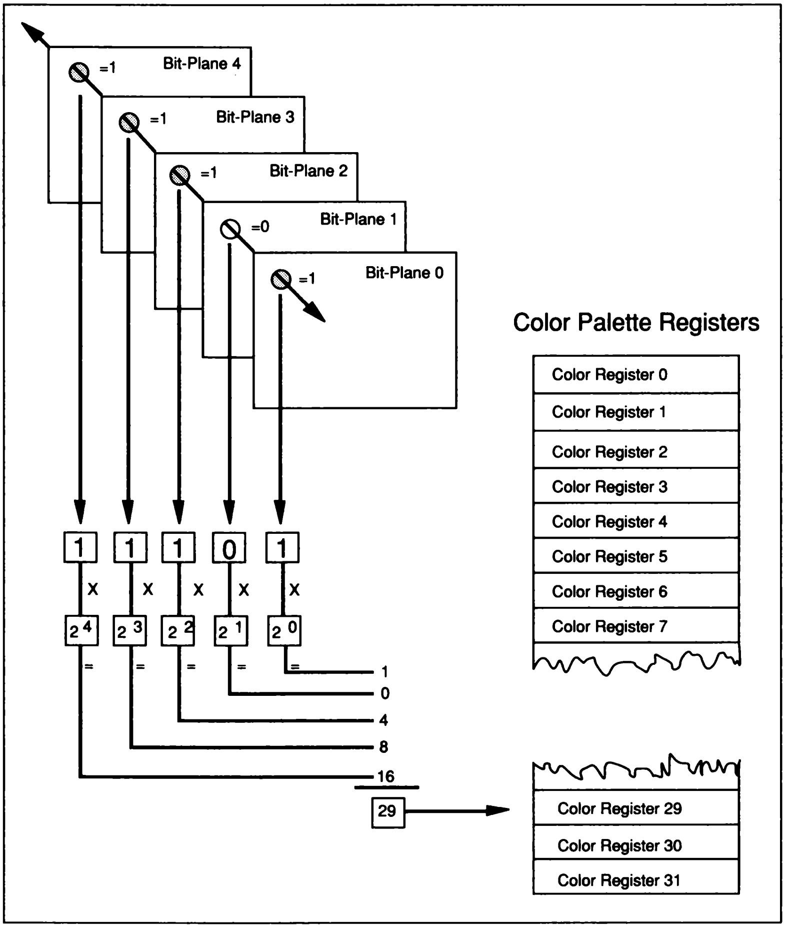

=1
Bit-Plane 4
=1
Bit-Plane 3
=1
Bit-Plane 2
=0
Bit-Plane 1
=1
Bit-Plane 0
Color Palette Registers
Color Register 0
Color Register 1
Color Register 2
Color Register 3
Color Register 4
Color Register 5
Color Register 6
Color Register 7
1
1
1
0
1
X
X
X
X
X
2⁴
2³
2²
2¹
2⁰
=
=
=
=
=
1
0
4
8
16
29
Color Register 29
Color Register 30
Color Register 31

Figure D-1 Low Resolution Pixel Color Selection

Low and High Resolutions work exactly alike, except that High resolution does not support as many bit planes, and therefore provides fewer colors. Figure D-2 lists the graphics modes and the number of bit planes and colors each supports. Notice that

Hold And Modify mode is a departure from the notion that each additional bit plane doubles the number of colors available. Hold and Modify is a special case that we'll explain in a moment.

	Graphics Mode			
Number of Bit-Planes	320x200	320x400	640x200	640x400
1	2	2	2	2
2	4	4	4	4
3	8	8	8	8
4	16	16	16	16
5	32	32	n/a	n/a
6	64 / 4096	64 / 4096	n/a	n/a

Figure D-2 Number of Colors in Each Display Mode

Extra-Halfbrite Display Mode

Extra-Halfbrite uses a trick to increase the number of colors available on the screen. The Amiga supports only 32 color registers directly, but Extra-Halfbrite uses a sixth bit plane to indicate an additional 32 registers that don't really exist. The first 32 registers are standard color registers; the second 32 are halfbrite equivalents. Pixels that use halfbrite colors point to one of the standard color registers and indicate that the color should be displayed at half its normal intensity. This means that the second 32 pixels are not independant of the first 32; you can change the color values only in the first 32 registers, and the change is automatically reflected in the halfbrite equivalent. Figure B.3 shows how Extra-Halfbrite uses the bit planes and color registers.

❖ Not all Amiga 1000 computers support Extra-Halfbrite. The easiest way to find out whether or not your computer supports this display mode is to try it. Open an Extra-Halfbrite screen and look at the Palette (make sure the pointer is not in the Menu Bar or Toolbox). If the last 32 colors are the same as the first 32, your computer doesn't support Extra-Halfbrite.

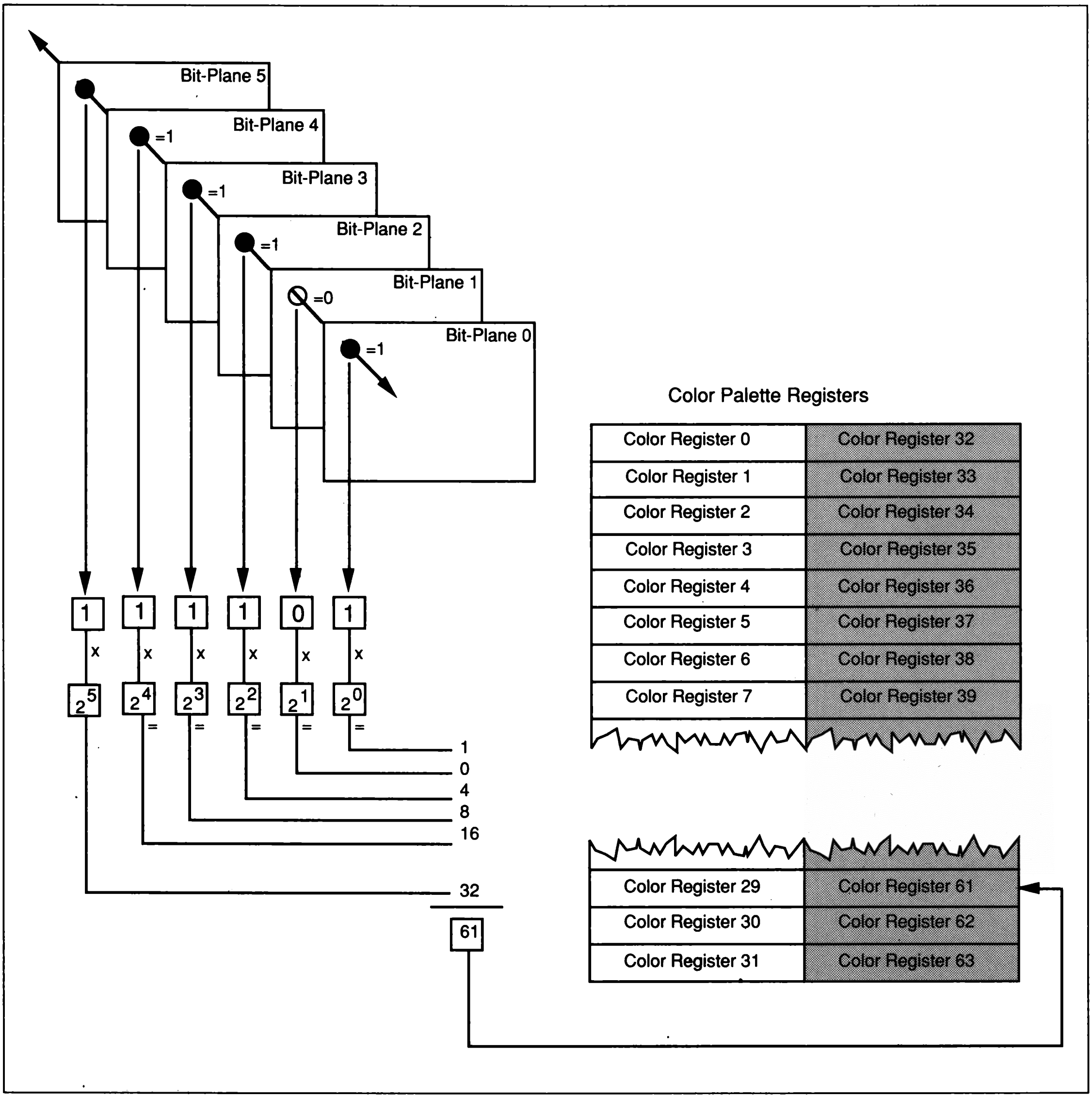

Bit-Plane 5
Bit-Plane 4
Bit-Plane 3
Bit-Plane 2
Bit-Plane 1
Bit-Plane 0
=1
=1
=1
=0
=1
1
1
1
1
0
1
x
2^5
2^4
2^3
2^2
2^1
2^0
=
1
0
4
8
16
32
61
Color Palette Registers
Color Register 0
Color Register 1
Color Register 2
Color Register 3
Color Register 4
Color Register 5
Color Register 6
Color Register 7
Color Register 32
Color Register 33
Color Register 34
Color Register 35
Color Register 36
Color Register 37
Color Register 38
Color Register 39
Color Register 29
Color Register 30
Color Register 31
Color Register 61
Color Register 62
Color Register 63

Figure D-3 Amiga Extra-Halfbrite Pixel Color Selection

Hold and Modify Display Mode

Hold and Modify display mode uses only 16 color registers, but manages to display all 4,096 colors on the screen at the same time. To accomplish this, HAM display mode uses the first four bit planes to address the 16 color registers, and uses the fifth and sixth bit plane to determine whether the register color or a HAM color should be used.

A HAM color is formed by taking the RGB value of the preceding pixel on the screen, and substituting a new value for one of the RGB components. The new value is the number derived from the first four bit planes. Here's a quick example:

Assume the color values of one pixel (a register color) are R3, G15, B11. The following pixel (a HAM color) would have the color values R13, G15, B11, if bit planes 0 through 3 pointed to register 13 and bit planes 4 and 5 indicated that the register value should be used to modify the red component of the preceding color. (Figure D-4 shows how the six bit planes are used to select a color in Hold and Modify mode.)

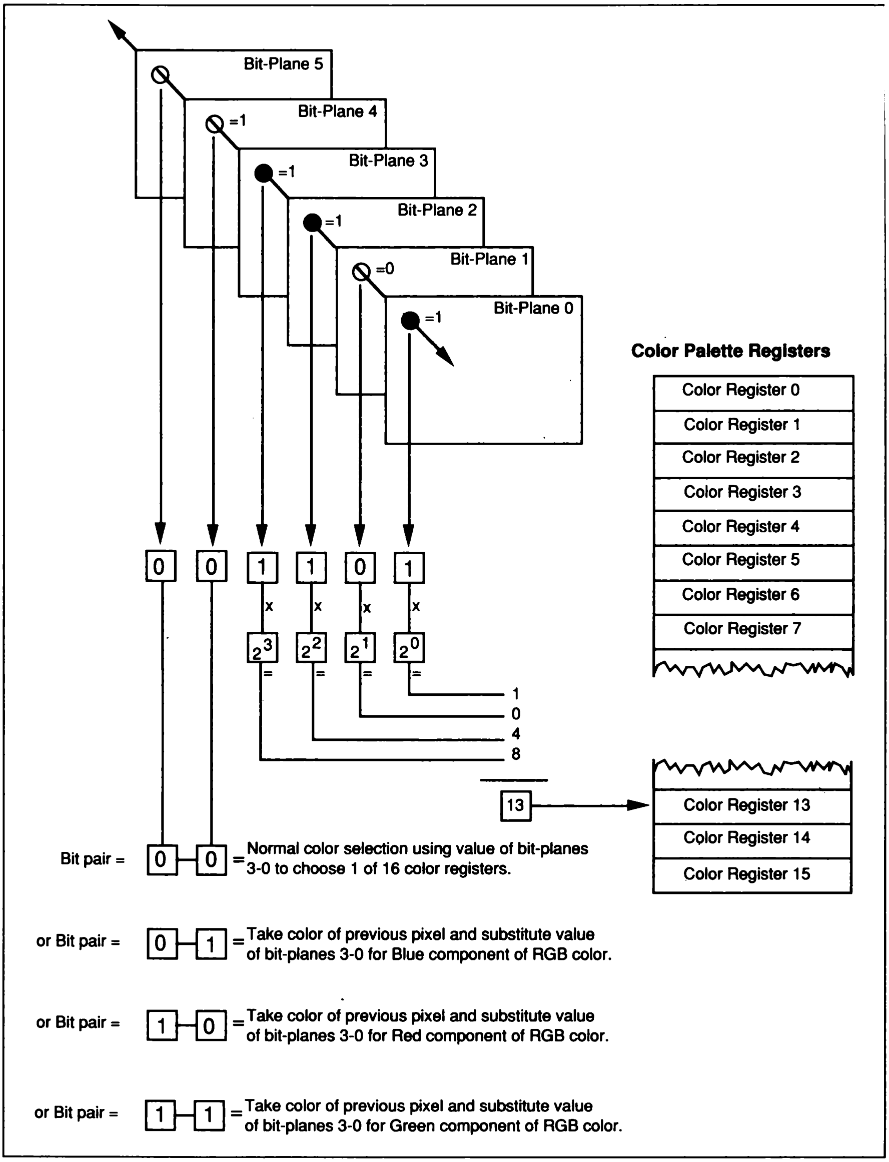

Bit-Plane 5
Bit-Plane 4
=1
Bit-Plane 3
=1
Bit-Plane 2
=1
Bit-Plane 1
=0
Bit-Plane 0
=1
Color Palette Registers
Color Register 0
Color Register 1
Color Register 2
Color Register 3
Color Register 4
Color Register 5
Color Register 6
Color Register 7
Color Register 13
Color Register 14
Color Register 15
0 0 1 1 0 1
x x x x
2^3 2^2 2^1 2^0
= = = =
1
0
4
8
13
Bit pair = 0 0 = Normal color selection using value of bit-planes 3-0 to choose 1 of 16 color registers.
or Bit pair = 0 1 = Take color of previous pixel and substitute value of bit-planes 3-0 for Blue component of RGB color.
or Bit pair = 1 0 = Take color of previous pixel and substitute value of bit-planes 3-0 for Red component of RGB color.
or Bit pair = 1 1 = Take color of previous pixel and substitute value of bit-planes 3-0 for Green component of RGB color.

Figure D-4 Hold and Modify Pixel Color Selection

Because HAM colors are based on color values of the preceding pixel, and only one color value can be changed at one time, it may take three pixels to reach the color you really wanted. In Figure D-5 it takes three pixels to change black (R0, G0, B0) to white (R15, G15, B15). Note that this example assumes there are no intermediate colors in the normal color registers. This gradual change from one color to the next is sometimes referred to as "ramping" the color, and appears on the screen to the left of HAM pixels. If you need fine details in your picture, you will want to use a color from the color registers, because those colors do not require ramping.

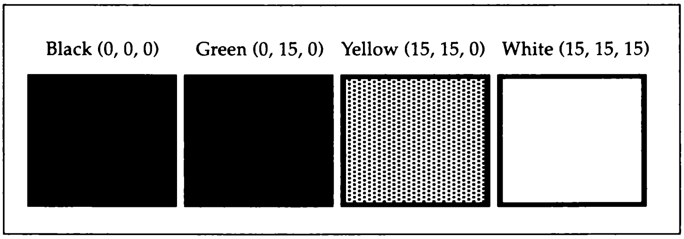


Figure D-5 HAM Color Ramping

In DeluxePaint IV, if you hold a brush over an area made up of HAM pixels, you may see an effect called "fringing." The fringing appears as streaks running to the right from the edge of the brush. This effect is only temporary. When you paint the brush onto the picture, DeluxePaint corrects the fringing, but you may see the "ramping" effect where DeluxePaint recreates the HAM color to the right of your brush.

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Lee Taran

When Lee entered Stanford University, she was an aspiring young artist. Oil painting had been her first love at Manhattan's famed School of Music and Art, and college might have been a pleasant diversion before entering the New York "Art Scene." At the prodding of some friends, she took a computer science course "for the fun of it."

Like many of the creative talents who have worked with Electronic Arts, Lee's entry into big-time programming began innocently enough with the Amiga. It's a familiar story: The Amiga was released, it was neat, it was fun, it had color, and suddenly — note the slightly crazed look of excitement typical in these cases — "I've got to program this thing!" Lee was hooked.

The art world became a sweet memory. Because Stanford had no undergraduate major in computer science, Lee designed a major for herself in AI, and took all the systems and computer science courses the university had to offer. She then took time away from school to get some graphics expereince, and wound up working at EA on some of Dan Silva's old code. Following six months of intensive hacking on the EGA/VGA support for the Prism graphics primitives, she returned to Stanford for her degree, and stayed on for an M.S. in Computer Systems.

Through all her training and diverse experience, computer graphics has remained an enduring passion. Her belief that high-quality artwork can be created with a computer led her back to Electronic Arts, and has resulted in DeluxePaint IV. And she won't stop there.

When she's away from the keyboard, Lee's a discriminating sci-fi fan, a connoisseur of trashy TV, and a dedicated aerobics/workout freak. She and her husband Ali share their home in Palo Alto, California with two big cats named Dido and Zack.

Dan Silva

Dan Silva is a legend. By the time Dan joined Electronic Arts in 1983, he had already worked with computers and computer graphics for twenty years. In productive stints at Informatics, Xerox, and Lucasfilm, he had designed a video editor, and new generation bitmap editor, and written an interactive language for displaying equations as graphic images. As important as his achievments was the fact that his work helped him form a clear idea of how the ideal paint program should behave.

At EA he started work on Prism, a paint program that was to be an in-house tool for software development. Prism eventually became DeluxePaint (1985), and it was an instant success. Dan started improving DeluxePaint almost immediately, and the result was DeluxePaint II (1986), the best paint program available for the Amiga at that time. And as fine a program as it was, Dan still wasn't satisfied. He could paint, but the paintings didn't move. Dan's lifelong fascination with animation became the driving force of the best-selling DeluxePaint III.

Dan has moved on to other projects but his code lives on. His mission to create the best graphic tools for the Amiga is embodied in DeluxePaint IV. We couldn't have done it without him.

Credits

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Special Thanks To: Jeff Bruette, Gene Brawn, Kara Blohm, Eric Lindstrom, Ali Özer, John Toebes, Steve Krueger and all of the people, both inside and outside of Electronic Arts, who helped make DeluxePaint I , II, and III happen. In particular, the members of the development team would like to thank their spouses and partners for the support and encouragement they offered during this project.

LightTable feature, including technology licensed from R&DL Productions, Inc. U.S. Patent No. 4,952,051.

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